CCD-TR490E
RMT-713

SERVICE MANUAL

AEP Model
UK Model
E Model
Australian Model
Hong Kong Model

SONY
SUPER LONG TIME RECORDING
48x DIGITAL ZOOM
Handycam Video 8
AF CCD
SONY

PHOTO : E Model

Video8
Handycam

B MECHANISM

For MECHANISM ADJUSTMENT, refer to the "8mm Video MECHANICAL ADJUSTMENT MANUAL Ⅶ" (9-973-801-11).

SPECIFICATIONS

Video Camera Recorder

System

Video recording system
Two rotary heads, Helical scanning, FM system

Audio recording system
Rotary heads, FM system

Video signal
PAL colour, CCIR standards

Usable cassette
8 mm video format cassette (standard 8 mm)

Recording/Playback time
SP mode: 1 hour and 30 minutes (P5-90)
LP mode: 3 hours (P5-90)

Fastforward/rewind time
Approx. 4 min. (P5-90)

Image device
CCD (Charge Coupled Device)

Viewfinder
Color

Lens
12x (optical) , 24x (digital) : AEP, UK ,
48x (digital) : E, AUS, HK,
combined power zoom lens, F1.8–2.7

Focal distance
f = 5.4 – 64.8 mm (7/32 – 2 5/8 inches), 39 – 468 mm (1 9/16 – 18 1/2 inches) when converted to a 35 mm still camera

Colour temperature
Auto

Minimum illumination*
0.8 lx at F 1.8 (Visible minimum low light 0.4 lx)

Illumination range
0.8 to 100,000 lx

Recommended illumination
More than 100 lx

* Minimum illumination expresses the light level a camcorder requires to produce a picture. Visible minimum low light expresses the light level to produce a visible signal.

Input and Output connectors

Video output
Phono jack, 1 Vp-p, 75 Ω, unbalanced

Audio output
Phono jack, 327 mV, (at load impedance 47 kΩ), impedance less than 2.2 kΩ
Stereo

RFU DC OUT
Special minijack, DC 5 V

Headphones jack
Stereo minijack (ø 3.5 mm)

LANC jack
Stereo-mini-mini-jack (ø 2.5 mm)

MIC jack
Stereo minijack
0.388 mV, low impedance with 2.5 to 3 V DC output, impedance 6.8 kΩ (ø 3.5 mm)

General

Power requirements
On battery mounting surface 6.0 V (battery pack), 7.5 V (AC power adaptor)

Average power consumption
4.1 W

Operating temperature
0°C to 40°C (32°F to 104°F)

Storage temperature
–20°C to +60°C (–4°F to +140°F)

Dimensions
Approx. 110 x 103 x 202 mm (4 3/8 x 4 1/8 x 8 inches) (w/h/d)

Mass
Excluding the battery pack, lithium battery, cassette and shoulder strap
Approx. 700g (1 lb 8 oz)
Including the battery pack NP-33, lithium battery CR2025, cassette P5-90 and shoulder strap
Approx. 920g (2 lb)

Microphone
Stereo type

— Continued on next page —

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

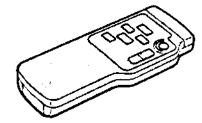
AC power adaptor

Power requirements
110 – 240 V AC, 50/60Hz
Power consumption
AC-V15: 18 W
AC-V16: 20 W
AC-V16A: 22 W
Output voltage
DC OUT in operation mode:
AC-V15: 7.5 V, 1.6 A
AC-V16/V16A: 7.5 V, 1.8 A
Battery charge terminal
10 V, 1.1 A in charge mode
Application
Sony battery packs NP-33 (supplied), NP-55H, NP-C65, NP-67, NP-77H, NP-77HD, NP-98, NP-98D
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to +60°C (–4°F to +140°F)
Dimensions
Approx. 166 x 43 x 75 mm (6 $^{5}/_{8}$ x 1 $^{11}/_{16}$ x 3 inches) (w/h/d) including projecting parts and controls
Mass
AC-V15/V16:
Approx. 420 g (15 oz)
AC-V16A:
Approx. 450 g (16 oz)

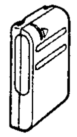
Checking Supplied Accessories

Check that the following accessories are supplied with your camcorder.

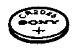
1



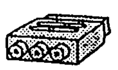
2



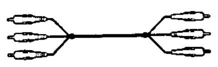
3



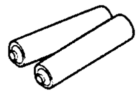
8



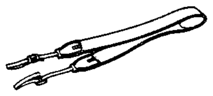
4



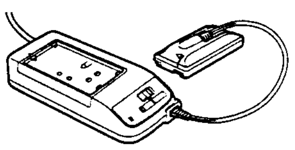
5



6



7



1 **Wireless Remote Commander (1)**

2 **NP-33 Battery Pack (1)**

3 **CR2025 Lithium Battery (1)**
Already installed in the camcorder.

4 **A/V connecting cable (1)**

5 **R6 (size AA) battery for Remote Commander (2)**

6 **Shoulder strap (1)**

7 **AC-V15/V16/V16A AC power adaptor (1)**

8 **21-Pin adaptor (1)**
(AEP, UK Model)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replace-ment.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270°C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

TABLE OF CONTENTS

SERVICE NOTE ······ 5

1. GENERAL

Checking Your Model Number ······ 1-1
Getting Started
  Charging and Installing the Battery Pack ······ 1-1
  Inserting a Cassette ······ 1-3
Basic Operations
  Camera Recording ······ 1-4
  Hints for Better Shooting ······ 1-7
  Checking the Recorded Picture ······ 1-8
  Connections for Playback ······ 1-8
  Playing back a Tape ······ 1-9
Advanced Operations
  Using Alternative Power Sources ······ 1-10
  Recording with the Date or Time ······ 1-12
  Shooting with Backlighting ······ 1-12
  Using the PROGRAM AE function ······ 1-13
  Shooting Scenery in Several Short Takes ······ 1-14
  Superimposing a Title ······ 1-14
  Using the Wide Mode function ······ 1-15
  Changing the Mode Settings ······ 1-15
  Editing onto Another Tape ······ 1-16
Additional Information
  Changing the Lithium Battery in the Camcorder ······ 1-16
  Resetting the Date and Time ······ 1-17
  Playback Modes ······ 1-18
  Tips for Using the Battery Pack ······ 1-18
  Maintenance Information and Precautions ······ 1-21
  Using Your Camcorder Abroad ······ 1-24
  Identifying the Parts ······ 1-25
  Warning Indicators ······ 1-30

2. DISASSEMBLY

2-1. REMOVAL OF F PANEL ASSY, MA-238 BOARD and MICROPHONE ······ 2-1
2-2. REMOVAL OF CABINET ASSY ······ 2-1
2-3. REMOVAL OF CASSETTE LID ASSY, LS LID, JK-129 and TZ-3 BOARD ······ 2-2
2-4. REMOVAL OF DD-80P BOARD ······ 2-2
2-5. REMOVAL OF ZOOM LENS and CD-139 BOARD ······ 2-3
2-6. REMOVAL OF VC-167P BOARD ······ 2-3
2-7. REMOVAL OF CF-40 BOARD ······ 2-4
2-8. REMOVAL OF PW-108 BOARD ······ 2-4
2-9. REMOVAL OF EVF BLOCK ASSY ······ 2-5
2-10. REMOVAL OF VF-93P, VF-94P and LB-44 BOARD ······ 2-5
2-11. INTERNAL VIEWS ······ 2-6
2-12. CIRCUIT BOARDS LOCATION ······ 2-7

3. BLOCK DIAGRAMS

3-1. OVERALL BLOCK DIAGRAM ······ 3-1
3-2. CAMERA BLOCK DIAGRAM ······ 3-4
3-3. VIDEO/AUDIO BLOCK DIAGRAM ······ 3-7
3-4. SYSTEM CONTROL BLOCK DIAGRAM ······ 3-9
3-5. MODE CONTROL BLOCK DIAGRAM ······ 3-11
3-6. EVF BLOCK DIAGRAM ······ 3-13
3-7. SERVO BLOCK DIAGRAM ······ 3-15
3-8. POWER BLOCK DIAGRAM ······ 3-18

4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM ······ 4-1
4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS ······ 4-5
- VC-167P(MAIN)PRINTED WIRING BOARD ······ 4-7
- VC-167P(CAMERA 1), CD-139(CCD IMAGER) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAMS ······ 4-11
- VC-167P(CAMERA 2)SCHEMATIC DIAGRAM 4-15
- VC-167P(CAMERA 3)SCHEMATIC DIAGRAM 4-18
- VC-167P(VIDEO 1)SCHEMATIC DIAGRAM ······ 4-21
- VC-167P(VIDEO 2), JK-129(JACK) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAMS ······ 4-24
- VC-167P(MODE CONTROL), FP-249(MODE SENSOR) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAMS ······ 4-27
- VC-167P(AUDIO AMP), MA-238(AUDIO) SCHEMATIC DIAGRAMS ······ 4-30
- MA-238(AUDIO)PRINTED WIRING BOARD ······ 4-33
- DD-80P(POWER)PRINTED WIRING BOARD ······ 4-35
- DD-80P(POWER), VC-167P(VTR SWITCH) SCHEMATIC DIAGRAMS ······ 4-37
- CF-40(SYSTEM CONTROL), PW-108(POWER SWITCH) PRINTED WIRING BOARDS ······ 4-40
- CF-40(SYSTEM CONTROL), PW-108(POWER SWITCH) SCHEMATIC DIAGRAMS ······ 4-43
- VF-93P(EXTERNAL LIGHT SENSOR), VF-94P(RGB DECODER), LB-44(BACK LIGHT) SCHEMATIC DIAGRAMS ······ 4-46
- VF-93P(EXTERNAL LIGHT SENSOR), VF-94P(RGB DECODER), LB-44(BACK LIGHT) PRINTED WIRING BOARDS ······ 4-49
- TZ-3(VISTA) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAMS ······ 4-53

5. REPAIR PARTS LIST

5-1. EXPLODED VIEWS ··· 5-1
- 5-1-1. OVERALL SECTION ··· 5-1
- 5-1-2. CABINET(L), F PANEL SECTION ··· 5-2
- 5-1-3. CABINET(R) SECTION ··· 5-3
- 5-1-4. EVF SECTION ··· 5-4
- 5-1-5. MAIN SECTION ··· 5-5
- 5-1-6. CASSETTE COMPARTMENT BLOCK SECTION ··· 5-6
- 5-1-7. LS CHASSIS BLOCK SECTION ··· 5-7
- 5-1-8. MECHANISM CHASSIS BLOCK SECTION ··· 5-8

5-2. ELECTRICAL PARTS LIST ··· 5-9

6. ADJUSTMENTS

6-1. CAMERA SECTION ADJUSTMENT ··· 6-1
- 1-1. PREPARATIONS BEFORE ADJUSTMENT ··· 6-1
  - 1-1-1. List of service tools ··· 6-1
  - 1-1-2. Precautions ··· 6-2
    - 1. Switch settings ··· 6-2
    - 2. Adjustment sequence ··· 6-2
    - 3. Subject ··· 6-2
  - 1-1-3. Preparations ··· 6-3
  - 1-1-4. Adjustment remote commander (RM-95 upgraded) ··· 6-4
    - 1. Using the adjustment remote commander ··· 6-4
    - 2. Precautions when using the adjustment remote commander ··· 6-5
- 1-2. CAMERA SYSTEM ADJUSTMENTS ··· 6-8
  - 1. Adjustment points when major parts have been replaced ··· 6-8
  - 2. Power supply voltage check (VC-167P board) 6-8
  - 3. Preparation for adjustment ··· 6-8
  - 4. Initialization of page F data ··· 6-9
  - 5. V SUB adjustment ··· 6-10
  - 6. VRG adjustment ··· 6-10
  - 7. Page F data modification ··· 6-11
  - 8. 28MHz crystal oscillator adjustment ··· 6-12
  - 9. HALL adjustment ··· 6-14
  - 10. Flange back adjustment ··· 6-16
  - 11. Flange back check ··· 6-17
  - 12. Picture frame setting ··· 6-18
  - 13. Color reproduction adjustment ··· 6-19
  - 14. IRIS IN/OUT adjustment ··· 6-20
  - 15. MAX gain adjustment ··· 6-21
  - 16. Auto white balance reference data input ··· 6-22
  - 17. Auto white balance adjustment ··· 6-23
  - 18. White balance check ··· 6-24
  - 19. Electronic viewfinder system adjustments (VF-93P, VF-94P board) ··· 6-25

6-2. MECHANISM SECTION ADJUSTMENTS ··· 6-29
- 2-1. HOW TO OPERATE THE MECHANISM AFTER THE CASSETTE COMPARTMENT IS REMOVED ··· 6-29
  - 1. How to load a cassette tape: ··· 6-29
  - 2. How to establish RECORD mode: ··· 6-29
  - 3. How to eject a cassette tape: ··· 6-29
  - 4. Processing after operation ··· 6-29
- 2-2. TAPE PATH ADJUSTMENT ··· 6-30
  - 1. Preparations for adjustments ··· 6-30

6-3. VIDEO SECTION ADJUSTMENT ··· 6-31
- 3-1. PREPARATIONS BEFORE ADJUSTMENT ··· 6-32
  - 3-1-1. Equipment required ··· 6-32
  - 3-1-2. Precautions on adjustment ··· 6-32
  - 3-1-3. Adjustment connector (VC-167P Board CN102) ··· 6-32
  - 3-1-4. Equipment connection ··· 6-33
  - 3-1-5. Alignment tape ··· 6-33
  - 3-1-6. Output level and impedance ··· 6-34
- 3-2. ADJUSTMENT POINTS WHEN MAJOR PARTS ARE REPLACED ··· 6-35
  - 1. When drum is replaced ··· 6-35
- 3-3. POWER SUPPLY SYSTEM ADJUSTMENT ··· 6-35
  - 1. Power supply voltage check (VC-167P board) 6-35
  - 2. VTR & CAM mode ON ··· 6-36
  - 3. EMG code (Emergency code) ··· 6-37
  - 4. MSW code ··· 6-37
  - 5. Bit value discrimination ··· 6-38
  - 6. Initializing the emergency code area ··· 6-39
  - 7. LED check ··· 6-39
  - 8. Key input check ··· 6-40
  - 9. Key input check (A/D port) ··· 6-40
  - 10. Individual operation of drum,capstan and loading motor ··· 6-41
- 3-4. SERVO SYSTEM ADJUSTMENTS ··· 6-42
  - 1. SYNC level and BURST level adjustments ··· 6-42
  - 2. Switching position adjustment ··· 6-43
  - 3. Capstan FG offset adjustment ··· 6-44
- 3-5. PLAYBACK FREQUENCY RESPONSE CHARACTERISTICS ADJUSTMENT ··· 6-45
- 3-6. DEMD OUT LEVEL ADJUSTMENT ··· 6-46
- 3-7. YD OUT ADJUSTMENT ··· 6-47
- 3-8. PB CHROMA LEVEL CHECK ··· 6-48
- 3-9. PB Y OUT LEVEL ADJUSTMENT ··· 6-49
- 3-10. FE OSC CHECK ··· 6-50
- 3-11. EMPHASIS INPUT LEVEL ADJUSTMENT ··· 6-51
- 3-12. Y FM DEVIATION ADJUSTMENT ··· 6-52
- 3-13. Y FM CARRIER FREQUENCY ADJUSTMENT ··· 6-53
- 3-14. CHROMA EMPHASIS fo ADJUSTMENT ··· 6-54
- 3-15. REC Y LEVEL ADJUSTMENT ··· 6-55
- 3-16. REC L LEVEL ADJUSTMENT ··· 6-56
- 3-17. REC C LEVEL ADJUSTMENT ··· 6-57

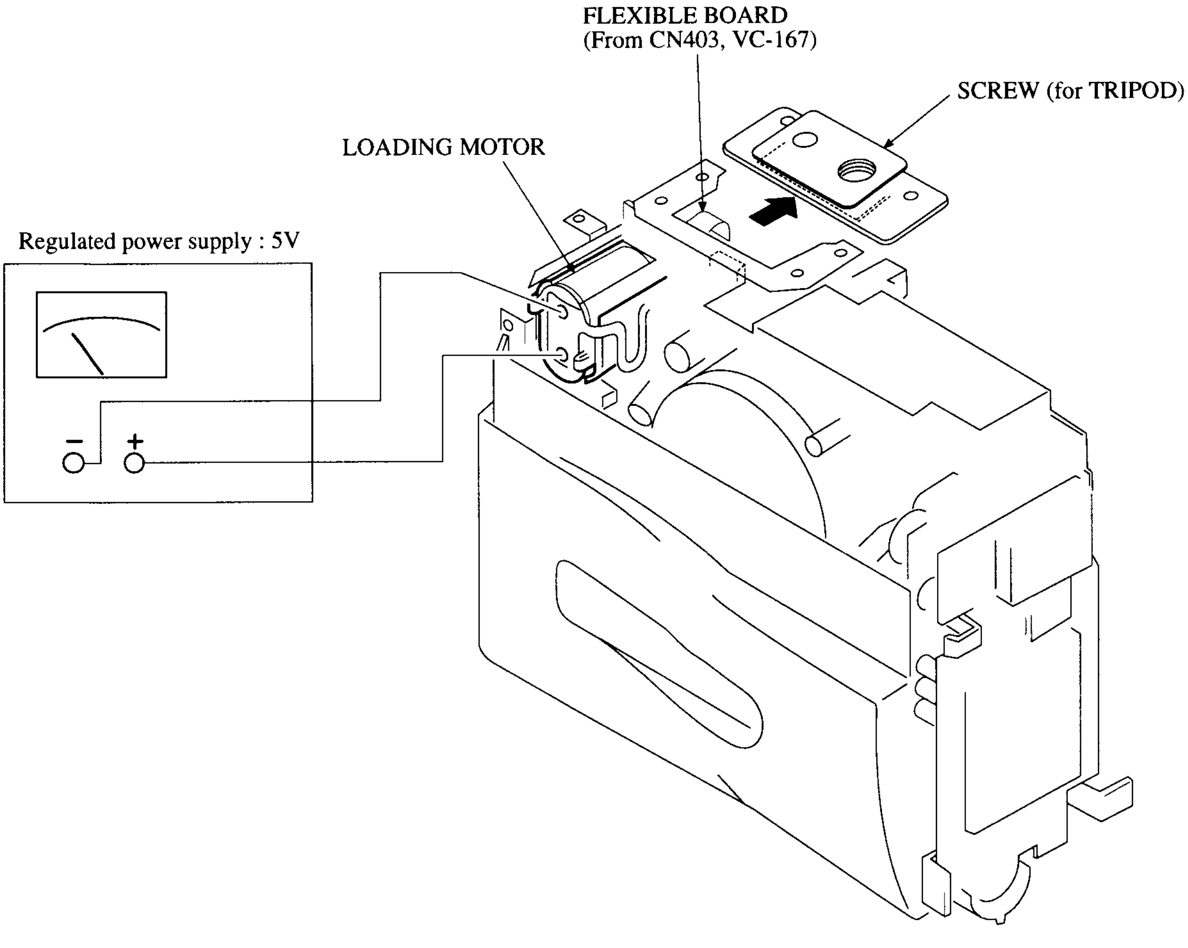
6-4. AUDIO SYSTEM ADJUSTMENT ··· 6-58
- 4-1. EE-OUTPUT LEVEL CHECK ··· 6-58
- 4-2. 1.5MHz DEVIATION ADJUSTMENT ··· 6-59
- 4-3. 1.7MHz DEVIATION ADJUSTMENT ··· 6-60
- 4-4. BPF fo ADJUSTMENT ··· 6-61
- 4-5. OVERALL SIGNAL LEVEL, DISTORTION AND SEPARATION CHECK ··· 6-62
- 4-6. OVERALL NOISE LEVEL CHECK ··· 6-63

※ The color reproduction frame is shown after the page of ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS.

SERVICE NOTE

· How to remove cassette if the main power cannot be switched ON. (Forced EJECT)

NOTE : To eject a cassette from the camcorder without turning on the main power, firstly remove the SCREW (for TRIPOD), then remove the FLEXIBLE BOARD as shown, and finally connect the regulated power supply ; +5V to the loading motor, this is to protect the main circuit from damage.


FLEXIBLE BOARD
(From CN403, VC-167)
SCREW (for TRIPOD)
LOADING MOTOR
Regulated power supply : 5V
–
+

SECTION 1
GENERAL

This section is extracted from combined instruction manual of models CCD-TR330E/TR440E/TR490E.

This service manual can be applied to only CCD-TR490E. (E Model)

Checking Your Model Number

Проверка номера Вашей модели

The instructions in this manual are for three models listed below. Before you start reading and operating, check your model number by looking at the bottom of your camcorder. The CCD-TR440E is the model used for illustration purposes. Otherwise, the model name is indicated in the illustrations. Any differences in operation are clearly indicated in the text, for example, "For CCD-TR490E only".
As you read through this manual, buttons and settings on the camcorder are shown in capital letters.
e.g. Set the POWER switch to CAMERA.

Инструкции в данном руководстве предназначены для трех нижеприведенных моделей. Перед тем, как Вы приступите к чтению и работе, проверьте номер Вашей модели, посмотрев на нижнюю панель Вашей видеокамеры. Модель CCD-TR440E использована в иллюстративных целях. В иных случаях наименование модели указывается на рисунках. Любые различия в работе четко указаны в тексте, как например "Только для CCD-TR490E".
Когда Вы будете читать руководство, учитывайте, что кнопки и установки на видеокамере показаны заглавными буквами.
прим. Установите выключатель POWER в положение CAMERA.

Types of Differences

Типы различий

Model Модель	Remote Commander Пульт дистанционного управления	Viewfinder Видоискатель		Zoom Трансфокатор	Wide mode Широкоформатный телевизор	Audio Аудиовыход	
		Black and white Черно-белый	Colour Цветной			Monaural Монофонический	Stereo Стереофонический
CCD-TR330E		●		10 ×		●	
CCD-TR440E	●		●	12 ×		●	
CCD-TR490E	●		●	12 × ←→ 48 ×	●		●

Contents of the recording cannot be compensated if recording or playback is not made due to a malfunction of the camcorder, video tape, etc.

Содержимое записи не может быть откорректировано, если запись или воспроизведение не выполняются из-за неисправности видеокамеры, видеоленты и т.д.

Charging and Installing the Battery Pack

Зарядка и установка батарейного блока

Before using your camcorder, you first need to charge and install the battery pack. To charge the battery pack, use the supplied AC power adaptor.

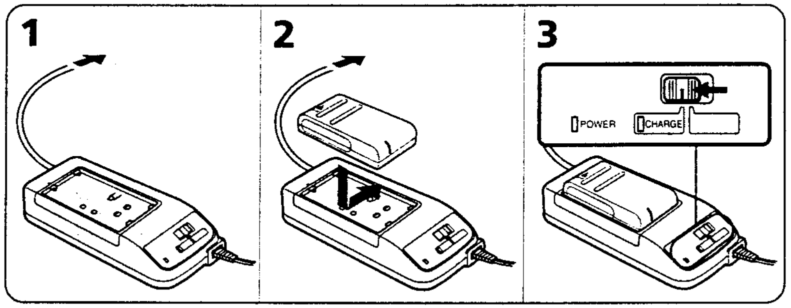
Charging the Battery Pack

Charge the battery pack on a flat place without vibration.
(1) Connect the AC power adaptor to the mains.
(2) Align the right side of the battery pack with the line on the AC power adaptor, then slide the battery pack in the direction of the arrow.
(3) Set the selector to CHARGE. The CHARGE lamp (orange) lights up. Charging begins.
When charging is completed, the CHARGE lamp goes out. Unplug the unit from the mains, and then remove the battery pack and install it on the camcorder.

Перед пользованием Вашей видеокамерой Вам следует сначала зарядить и установить батарейный блок. Для зарядки батарейного блока воспользуйтесь прилагаемым сетевым адаптером перем.тока.

Зарядка батарейного блока

Зарядку батарейного блока производите на ровной поверхности, не подверженной вибрации.
(1) Подсоедините сетевой шнур адаптера перем.тока к электрической сети.
(2) Установите правую сторону батарейного блока на одной линии с сетевым адаптером перем.тока, затем передвиньте батарейный блок в направлении стрелки.
(3) Установите селектор в положение CHARGE. Загорится лампочка CHARGE (оранжевая). Начнется зарядка.
Когда зарядка завершится, лампочка CHARGE погаснет. Отключите аппарат от электрической сети, а затем снимите батарейный блок и установите его на видеокамеру.



Charging Time

Battery pack	Charging time*
NP-33 (supplied)	60
NP-55H	85
NP-C65/67	105
NP-77H/77HD	170
NP-98/98D	215

* Approximate minutes to charge an empty pack using the supplied AC power adaptor (Lower temperatures require a longer charging time.)

Время зарядки

Батарейный блок	Время зарядки*
NP-33 (прилагается)	60
NP-55H	85
NP-C65/67	105
NP-77H/77HD	170
NP-98/98D	215

* Приблизительно в минутах для зарядки разряженного батарейного блока с использованием прилагаемого сетевого адаптера перем. тока. (При низких температурах время зарядки удлиняется.)

Charging and Installing the Battery Pack

Battery Life

CCD-TR330E

Battery pack	Typical recording time**	Continuous recording time***
NP-33 (Supplied)	50	90
NP-55H	60	110
NP-C65/67	85	155
NP-77H/77HD	135	235
NP-98/98D	175	305

CCD-TR440E

Battery pack	Typical recording time**	Continuous recording time***
NP-33 (Supplied)	45	85
NP-55H	60	110
NP-C65/67	85	155
NP-77H/77HD	130	230
NP-98/98D	170	300

CCD-TR490E

Battery pack	Typical recording time**	Continuous recording time***
NP-33 (Supplied)	45	80
NP-55H	55	100
NP-C65/67	75	140
NP-77H/77HD	120	210
NP-98/98D	155	270

** Approximate minutes when recording while you repeat recording start/stop, zooming and turning the power on/off. The actual battery life may be shorter.

*** Approximate continuous recording time indoors.

Зарядка и установка батарейного блока

Срок службы батареек

CCD-TR330E

Батарейный блок	Время типичной записи**	Время непрерывной записи***
NP-33(прилагается)	50	90
NP-55H	60	110
NP-C65/67	85	155
NP-77H/77HD	135	235
NP-98/98D	175	305

CCD-TR440E

Батарейного блока	Время типичной записи**	Время непрерывной записи***
NP-33(прилагается)	45	85
NP-55H	60	110
NP-C65/67	85	155
NP-77H/77HD	130	230
NP-98'98D	170	300

CCD-TR490E

Батарейного блока	Время типичной записи**	Время непрерывной записи***
NP-33(прилагается)	45	80
NP-55H	55	100
NP-C65/67	75	140
NP-77H/77HD	120	210
NP-98/98D	155	270

** Приблизительная продолжительность в минутах при записи, когда Вы повторяете начало/останов записи, трансфокацию и включаете/выключаете питание. Реальный срок службы батарейного блока может быть короче.

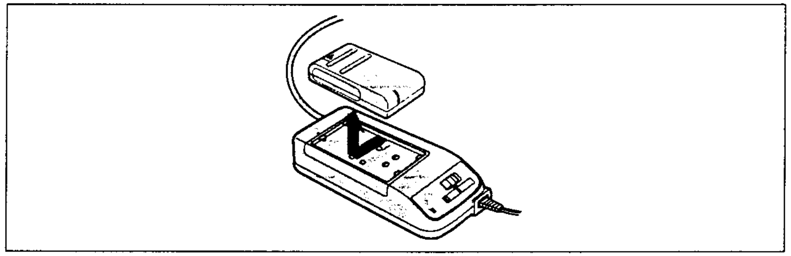
*** Приблизительное время непрерывной записи в помещении.

Removing the Battery Pack

Slide the battery pack in the direction of the arrow.

Снятие батарейного блока

Передвиньте батарейный блок в направлении стрелки.



Notes on charging the battery pack

- The POWER lamp will remain lit for a while even if the battery pack is removed and the mains lead is unplugged after charging the battery pack. This is normal.
- If the POWER lamp does not light, set the selector to VTR (DC OUT) and disconnect the mains lead. After about one minute, reconnect the mains lead and set the selector to CHARGE again.
- You cannot operate the camcorder using the AC power adaptor while charging the battery pack.

Примечания по зарядке батарейного блока

- Лампочка POWER будет некоторое время светиться, даже, если батарейный блок снят и сетевой шнур отключен после зарядки батарейного блока. Это является нормальным.
- Если лампочка POWER не загорается, установите селектор в положение VTR (DC OUT) и отсоедините сетевой шнур. Примерно через минуту вновь подсоедините сетевой шнур и опять установите селектор в положение CHARGE.
- Вы не можете управлять видеокамерой с использованием сетевого адаптера перем.тока во время зарядки батарейного блока.

Charging and Installing the Battery Pack

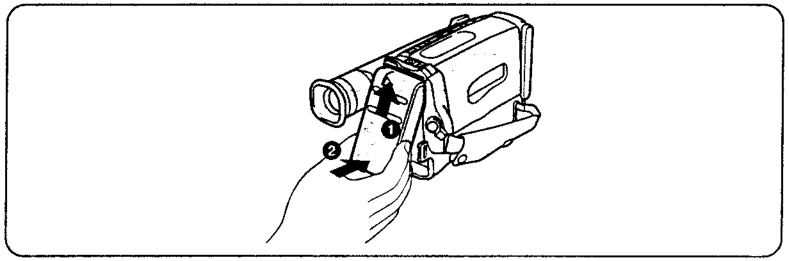
Зарядка и установка батарейного блока

Installing the Battery Pack

(1) Insert the top of the battery pack into the top of the battery mounting surface.
(2) Push the battery pack so that it attaches firmly.

Установка батарейного блока

(1) Вставьте верхний конец батарейного блока в верхнюю часть батарейной установочной поверхности.
(2) Нажмите батарейный блок, так, чтобы он был надежно присоединен.

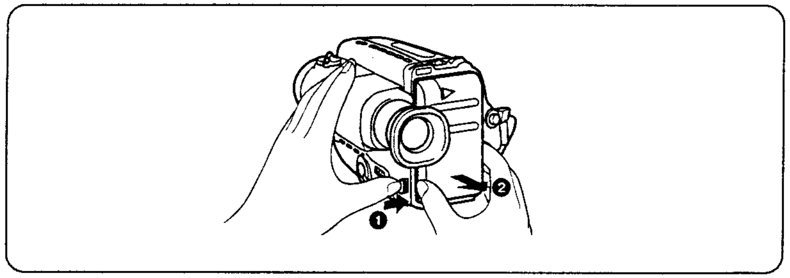


Removing the Battery Pack

Slide BATT, and then pull the lower part of the battery pack.

Снятие батарейного блока

Сдвиньте BATT, а затем потяните за нижнюю часть батарейного блока.



Inserting a Cassette

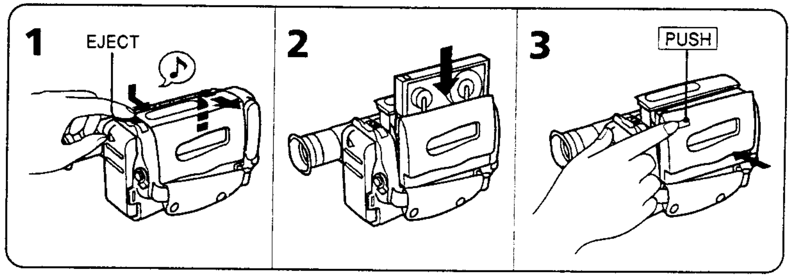
Вставка кассеты

Make sure that a power source is installed.
(1) While pressing the small blue button, slide EJECT in the direction of the arrow. The cassette compartment automatically opens.
(2) Insert a cassette (not supplied) with the window facing out.
(3) Press the PUSH mark on the cassette compartment to close it. The cassette compartment automatically closes.

♪: You can hear the beep sound to confirm your operation.

Убедитесь, что источник питания установлен.
(1) Нажимая маленькую синюю кнопку, сдвиньте EJECT в направлении стрелки. Отсек кассеты автоматически открывается.
(2) Вставьте кассету (не прилагается) окошком, обращенным наружу.
(3) Нажмите метку PUSH на отсеке кассеты для его закрытия. Отсек кассеты автоматически закрывается.

♪: Вы можете слышать зуммерный звуковой сигнал для подтверждения Вашей работы.



To Eject the Cassette

While pressing the small blue button, slide EJECT in the direction of the arrow.

To Prevent Accidental Erasure

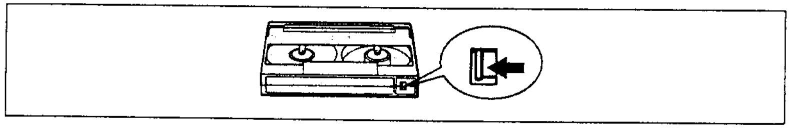
Slide the tab on the cassette to expose the red mark.
If you insert the cassette with the red mark exposed and close the cassette compartment, the beeps sound for a while. If you try to record with the red mark exposed, the ⊠ and ⏏ indicators flash in the viewfinder, and you cannot record on the tape. To re-record on this tape, slide the tab back out to cover the red mark.

Для выталкивания кассеты

Нажимая маленькую синюю кнопку, сдвиньте EJECT в направлении стрелки.

Для предотвращения случайного стирания

Передвиньте лепесток на кассете, чтобы появилась красная метка.
Если Вы вставите кассету при выставленной красной метке и закроете отсек кассеты, то зазвучит зуммерный сигнал. Если Вы попытаетесь записывать при выставленной красной метке, в видоискателе будут мигать индикаторы ⊠ и ⏏, и Вы не сможете произвести запись. Для перезаписи на данную ленту передвиньте лепесток назад, чтобы закрыть красную метку.



Camera Recording

Make sure that a power source and a cassette is inserted.
When you use the camcorder for the first time, power on it and reset the date and time to your time (p. 39) before you start recording. When you reset the date and time, the date is automatically recorded for 10 seconds after you start recording (AUTO DATE feature). This feature works only once a day.
Before you record one-time events, you may want to make a trial recording to make sure that you are using the camcorder correctly.

(1) While pressing the small green button on the POWER switch, turn it to CAMERA.
(2) Slide the START/STOP MODE switch to ⊥ .
(3) Turn STANDBY up. The "STBY" indicator appears in the viewfinder.
(4) Press START/STOP (red button). The camcorder starts recording and the "STBY" indicator changes to the "REC" indicator.

You can also select Recording mode, SP (standard play) mode or LP (long play) mode. Set REC MODE (P. 35) according to the length of your planned recording before you start.

♪: You can hear the beep sound to confirm your operation.

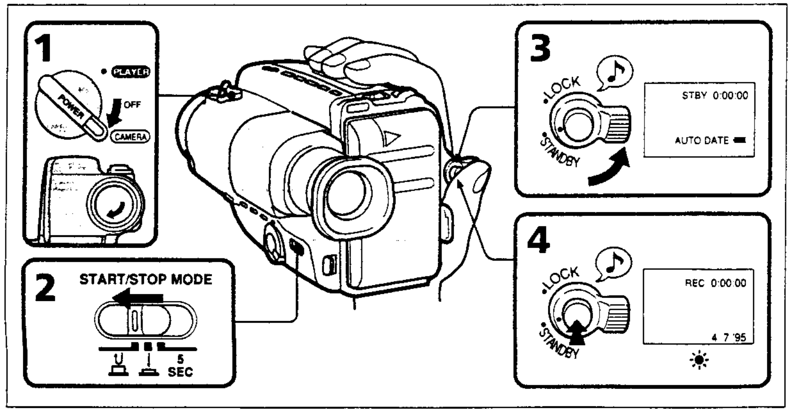
Запись с помощью видеокамеры

Убедиться, что источник питания и кассета вставлены.
Если Вы используете видеокамеру в первый раз, то включите ее питание и установите дату и время на Ваше время (стр. 39) перед тем. как Вы начнете запись. Когда Вы установите дату и время, дата автоматически будет записываться в течение 10 секунд после начала записи (функция AUTO DATE). Эта функция работает только один раз в день.
Перед тем, как Вы начнете запись одноразовых событий, Вы можете захотеть сделать пробу для подтверждения, что Вы используете видеокамеру правильно.

(1) Нажимая маленькую зеленую кнопку на выключателе POWER, сдвиньте его в положение CAMERA.
(2) Сдвиньте переключатель START/STOP MODE в положение ⊥ .
(3) Поверните STANDBY вверх. Индикатор "STBY" появится в видоискателе.
(4) Нажмите START/STOP (красная кнопка). Видеокамера начинает запись, и индикатор "STBY" изменится на индикатор "REC".

Вы также можете выбрать режим записи, режим SP (стандартное воспроизведение) или режим LP (удлиненное воспроизведение). Установите REC MODE в системе меню (стр. 35) в соответствии с длительностью планируемой Вами записи перед началом.

♪: Вы можете слышать зуммерный звуковой сигнал для подтверждения Вашей работы.



To Stop Recording Momentarily [a]

Press START/STOP again. The "REC" indicator in the viewfinder changes to the "STBY" indicator (**Standby mode**).

To Finish Recording [b]

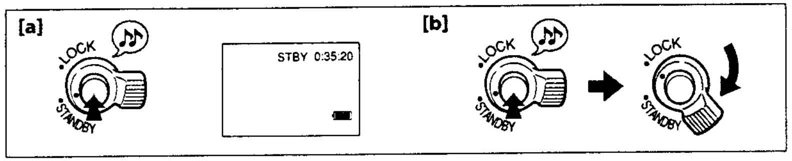
Press START/STOP. Turn STANDBY down, and set the POWER switch to OFF.
Then, eject the cassette (p. 11) and remove the battery (p. 10).

Для временной остановки записи [a]

Нажмите опять START/STOP. В видоискателе индикатор "REC" изменится на индикатор "STBY" (**режим готовности**).

Для окончания записи [b]

Нажмите START/STOP. Поверните STANDBY вниз и установите выключатель POWER в положение OFF. Затем вытолкните кассету (стр. 11) и удалите батарейный блок (стр. 10).



Note on Standby mode
If you leave the camcorder for 5 minutes or more with a cassette inserted in Standby mode, the camcorder goes off automatically. This prevents wearing down the battery and wearing out the tape. To resume Standby mode, turn STANDBY down once and turn it up again. To start recording, press START/STOP.

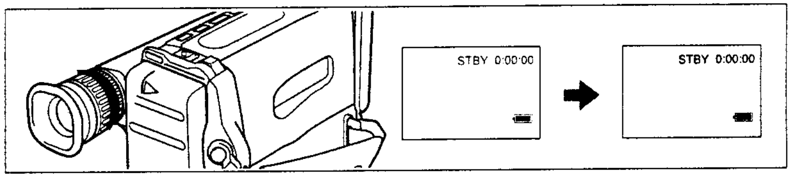
To Focus the Viewfinder Lens

If the viewfinder is not in focus at all or when you use the camcorder after someone else has used it, focus the viewfinder lens. Turn the viewfinder lens adjustment ring so that the indicators in the viewfinder come into sharp focus.

Примечание к режиму готовности
Если Вы оставляете видеокамеру на 5 минут или более со вставленной кассетой в режиме готовности, то видеокамера выключится автоматически. Это предотвращает разрядку батареи и износ ленты. Для возобновления режима готовности один раз поверните STANDBY вниз и снова поверните его вверх. Для начала записи нажмите START/STOP.

Для фокусировки объектива видоискателя

Если видоискатель вообще не сфокусирован, или если Вы используете видеокамеру после того, как ее использовал кто-то другой, то сфокусируйте объектив видоискателя. Поверните регулировочное кольцо объектива видоискателя так, чтобы индикаторы в видоискателе были четко сфокусированы.



Note on the indicators in the viewfinder
The indicators appear in CAMERA mode only. They do not appear in PLAYER mode.

Примечание к индикаторам в видоискателе
Индикаторы появляются только в режиме CAMERA. Они не появляются в режиме PLAYER.

Camera Recording

Запись с помощью видеокамеры

Recording with the START/STOP button depressed

You can also make recording while pressing down the START/STOP button. To make the START/STOP button work this way, slide the START/STOP MODE switch to ⊥ . **[a]**

Shooting scenery in several short takes

You can automatically make recording for about 5 seconds with the 5 SEC (p. 32). To make the START/STOP button work this way, slide the START/STOP MODE switch to 5 SEC. **[b]**

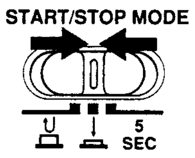
Запись при нажатой кнопке START/STOP

Вы можете также выполнить запись при нажатой кнопке START/STOP. Чтобы кнопка START/STOP работала таким образом, передвиньте переключатель START/STOP MODE в положение ⊥ . **[a]**

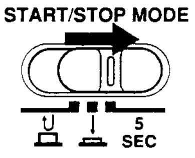
Съемка пейзажа за несколько коротких приемов

Вы можете производить автоматическую запись приблизительно в течение 5 секунд с помощью 5 SEC (стр. 32). Для того, чтобы кнопка START/STOP работала таким образом, передвиньте переключатель START/STOP MODE в положение 5 SEC. **[b]**

[a]



[b]



Note on recording

When you record from the beginning of the tape, run the tape for about 15 seconds before actual recording. This prevents the camcorder from missing any start-up scenes when you play back the tape.

Recording mode

This camcorder records in the SP mode (approximately 20.051 mm/second) and in the LP mode (approximately 10.058 mm/second) (p.35) and can play back in the SP mode and LP mode. The playback quality in the LP mode, however, will not be as good as that in the SP mode.

Примечание к процессу записи

Если Вы производите запись с самого начала ленты, дайте возможность ленте переместиться около 15 секунд до начала записи. Это предотвратит пропуск начальных сюжетов съемки, когда Вы будете воспроизводить ленту.

Режим записи

Данная видеокамера производит запись в режиме SP (приблизительно 20,051 мм/сек.) и в режиме LP (приблизительно 10,058 мм/сек.) (стр. 35) и может выполнять воспроизведение в режиме SP и в режиме LP. Однако качество воспроизведения в режиме LP не будет столь хорошим, как в режиме SP.

Notes on the tape counter

- The tape counter indicates the recording time. Use it as a guide. There will be a time lag of several seconds from the actual time. To set the counter to zero, press COUNTER RESET located below the viewfinder.
- If the tape is recorded in SP and LP modes mixed, the tape counter shows incorrect recording time. When you intend to edit the tape using the tape counter, record in same (SP or LP) mode.

Note on beep sound

As indicated with ♪ in the illustrations, a beep sounds when you turn the power on or when you start recording and two beeps sound when you stop recording, confirming the operation. Several beeps also sound as a warning of any unusual condition of the camcorder (p.70). Note that the beep sound is not recorded on the tape. If you do not want to hear the beep sound, set BEEP to "OFF" (p.35).

Note on the AUTO DATE feature

The clock is set to Sydney for Australia and New Zealand models, to Tokyo for Japan models and to Hong Kong for other models at the factory. You can reset the clock (p. 39).

The AUTO DATE feature works once a day. However, the date may automatically appear more than once a day when:

- you reset the date and time.
- you eject and insert the cassette again.
- you stop recording within 10 seconds.

When moving from indoors to outdoors (or vice versa)

Turn STANDBY up and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.

Примечание к счетчику ленты

- Счетчик ленты указывает время записи. Используйте его в качестве руководства. Там будет отставание по времени на несколько секунд от фактического времени. Для установки счетчика на нуль нажмите кнопку COUNTER RESET, расположенную ниже видоискателя.
- Если лента записана в обоих режимах SP и LP, счетчик ленты будет показывать неправильное время. Если Вы намереваетесь произвести монтаж ленты с использованием счетчика времени, производите запись в том же режиме (SP или LP).

Примечание к зуммерному звуковому сигналу

Как указано с помощью ♪ на рисунках, зуммерный сигнал звучит, когда Вы начинаете запись, и два зуммерных сигнала звучат, когда Вы заканчиваете запись, подтверждая тем самым работу. Несколько зуммерных сигналов также звучит в качестве предупреждения какого-либо ненормального состояния видеокамеры (стр. 70). Заметьте, что зуммерный звуковой сигнал не записывается на ленту. Если Вы не хотите слышать зуммерный сигнал, то установите "BEEP" в положение "OFF" (стр. 35).

Примечание к функции AUTO DATE

Часы установлены на заводе на время Сиднея для австралийских и новозеландских моделей, на время Токио для японских моделей и на время Гонконга для других моделей. Вы можете повторно установить часы (стр. 39).

Функция AUTO DATE работает один раз в день. Однако, дата может появиться более одного раза в день, если:

- Вы сбросите дату и время.
- Вы вытолкнете кассету и вставите ее снова.
- Вы остановите запись в пределах 10 секунд.

При выходе из помещения на улицу (или наоборот)

Поверните STANDBY вверх и наведите видеокамеру на белый объект приблизительно на 15 секунд так, чтобы белый баланс был отрегулирован правильно.

Using the Zoom Feature

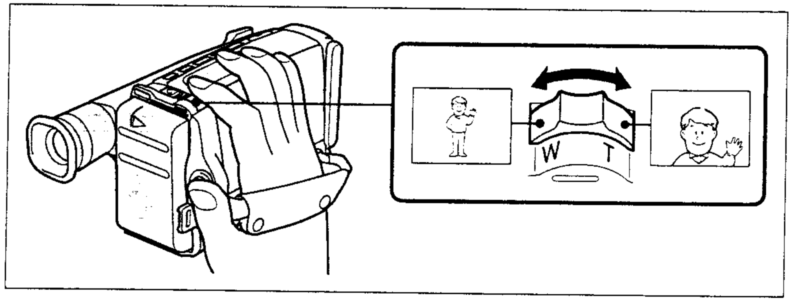
Zooming is a recording technique that lets you change the size of the subject in the scene. For more professional-looking recordings, use the zoom sparingly.

T side: for telephoto (subject appears closer)
W side: for wide-angle (subject appears farther away)

Использование функции наезда видеокамеры

Наезд видеокамеры является техническим приемом записи, который позволяет Вам изменять размер объекта в кадре. Не злоупотребляйте этим приемом, если хотите, чтобы Ваши записи выглядели более профессионально.

Сторона T: для телефото (объект приближается)
Сторона W: Для широкого угла съемки (объект удаляется)



Zooming Speed

Turn the power zoom lever fully for a high-speed zoom. Turn it lightly for a relatively slow zoom.

When you shoot a subject using a telephoto zoom

If you cannot get a sharp focus while in extreme telephoto zoom, turn the power zoom lever towards the W side until the focus is sharp.

You can shoot a subject that is at least 80 cm (about 2.6 feet) away from the lens surface in the telephoto position, or 1 cm (about 1/2 inches) in the wide-angle position.

Скорость наезда видеокамеры

Полностью поверните рычаг приводного трансфокатора для быстрого наезда видеокамеры, Поверните его слегка для медленного наезда телекамеры.

Когда Вы снимаете объект, используя наезд в режиме телефото

Если Вы не можете получить четкой фокусировки во время крайнего наезда в режиме телефото, то поворачивайте рычаг приводного трансфокатора в сторону W до тех пор, пока не получите четкой фокусировки.

Вы можете произвести съемку предмета, который по меньшей мере находится на расстоянии 80 см от поверхности объектива в положении телефото, или 1 см в положении широкого угла.

Notes on Digital Zoom (for CCD-TR490E only)

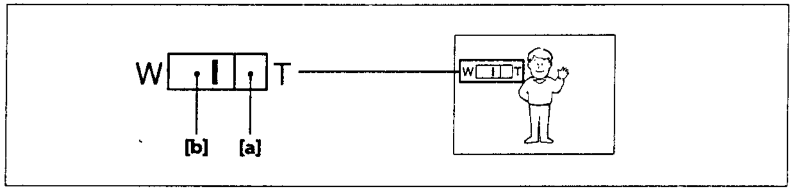
You can select 12 x or 48 x of zooming.

- More than 12 x zoom is performed digitally, and the picture quality deteriorates as you go toward the T side. If you do not want to use the digital zoom set the ZOOM function to x12 (p.35).
- The vertically bar in the power zoom indicator separates the digital zooming zone (right side of the bar [a]) and the optical zooming zone (left side of the bar [b]). If you side the ZOOM switch to x12, the right side of the bar [a] disappears.

Примечания по цифровому трансфокатору (только для модели CCD-TR490E)

Вы можете выбрать трансфокацию 12x или 48x.

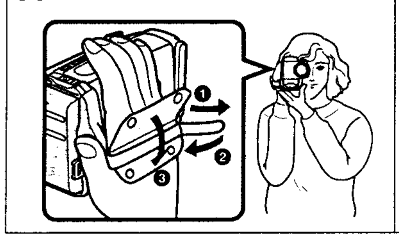
- Трансфокация более, чем 12x, производится цифровым способом, и качество изображения ухудшается по мере перемещения в сторону T. Если Вы не хотите использовать цифровой трансфокатор, установите функцию ZOOM в положение x12 (стр. 35).
- Вертикальная полоса на индикаторе приводного трансфокатора разделяет интервал цифровой трансфокации (правая сторона от полосы [a]) и интервал оптической трансфокации (левая сторона от полосы [b]). Если Вы передвинете переключатель ZOOM в положение 12x, правая сторона от полосы [a] исчезнет.



Hints for Better Shooting

For hand-held shots, you'll get better results holding the camcorder according to the following suggestions:

[a]

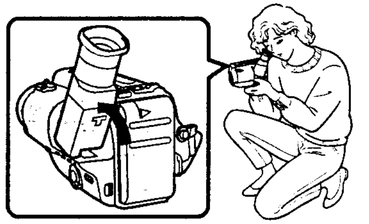


- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the controls with your thumb. **[a]**
- Place your right elbow against your side.
- Place your left hand under the camcorder to support it. Do not cover the microphone with your fingers.
- Place your eye firmly against the viewfinder eyecup.
- Use the viewfinder frame as a guide to determine the horizontal plane.
- You can also record in a low position to get an interesting recording angle. Turn the viewfinder up for recording from a low position. **[b]**

Советы для лучшей съемки

Для кадров при поддержке рукой Вы получите лучшие результаты, удерживая видеокамеру в соответствии со следующими указаниями.

[b]



- Надежно держите видеокамеру и предохраняйте ее с помощью ременного захвата так, что Вы сможете легко манипулировать регуляторами с помощью Вашего большого пальца. **[a]**
- Расположите Ваш правый локоть напротив Вашего бока.
- Расположите Вашу левую руку под видеокамерой для ее поддержки. Не закройте микрофон Вашими пальцами.
- Расположите Ваш глаз точно напротив окуляра видоискателя.
- Используйте визирную рамку видоискателя в качестве руководства для определения горизонтального плана.
- Вы также можете осуществлять запись из нижнего положения для получения интересного угла записи. Поверните видоискатель вверх для записи из нижнего положения. **[b]**

Place the camcorder on a flat surface or use a tripod

Try placing the camcorder on a table top or any other flat surface of suitable height. If you have a tripod for a still camera, you can also use it with the camcorder (p. 62).

When attaching a non-Sony tripod, make sure the tripod screw is shorter than 6.5 mm (9/32 in). Otherwise, the screw may damage the inner parts of the camcorder.

Cautions on the viewfinder

- Do not pick up the camcorder by the viewfinder. **[c]**
- Do not place the camcorder so as to point the viewfinder toward the sun. The inside of the viewfinder may be deformed. Be careful in placing the camcorder under sunlight or by the window. **[d]**

Располагайте видеокамеру на плоской поверхности или используйте треножник

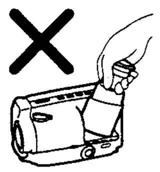
Старайтесь располагать видеокамеру на столе или другой плоской поверхности подходящей высоты. Если у Вас имеется треножник для фотоаппарата, Вы можете использовать его и для видеокамеры (стр. 62).

При прикреплении к треножнику, отличному от фирмы Sony убедитесь, что крепежный винт треножника короче 6,5 мм. В противном случае винт может повредить внутренние детали видеокамеры.

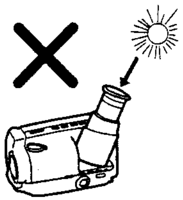
Меры предосторожности при обращении с видоискателем

- Не поднимайте видеокамеру, держа ее за видоискатель. **[c]**
- Не располагайте видеокамеру таким образом, чтобы видоискатель был направлен в сторону солнца. Это может привести к деформации внутренних частей видоискателя. Будьте осторожны, оставляя видеокамеру на солнце или возле окна. **[d]**

[c]



[d]



Checking the Recorded Picture

Using EDITSEARCH, you can review the last recorded scene or check the recorded picture in the viewfinder.

(1) While pressing the small green button on the POWER switch, turn it to CAMERA.

(2) Turn STANDBY up.

(3) Press EDITSEARCH. Press the - (⊜) side momentarily, the last few seconds of the recorded portion plays back (**Rec Review**).

Hold down the - side of EDITSEARCH until the camcorder goes back to the scene you want. The last recorded portion is played back. To go forward, hold down the + side (**Editsearch**).

Проверка записанного изображения

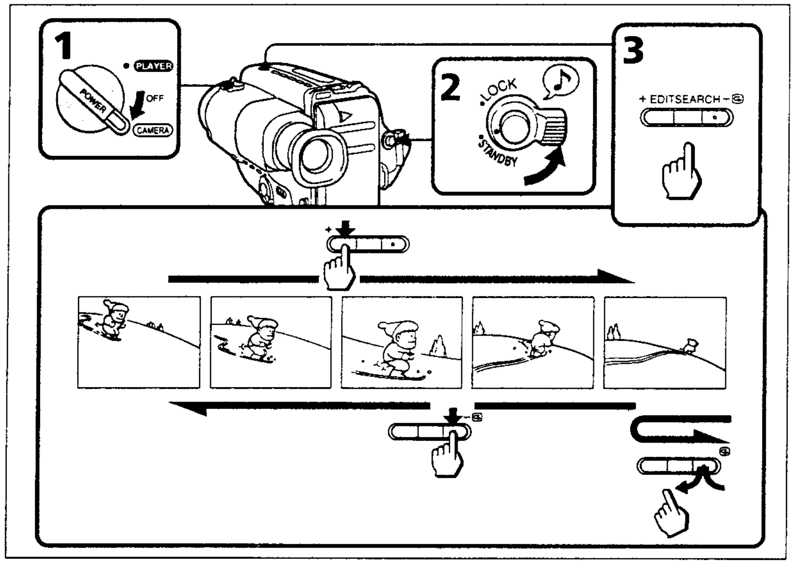
Используя EDITSEARCH Вы можете просмотреть последнюю записанную сцену или проверить записанное изображение в видоискателе.

(1) Нажимая маленькую зеленую кнопку на выключателе POWER, поверните его в положение CAMERA.

(2) Поверните STANDBY вверх.

(3) Нажмите EDITSEARCH. Нажмите сторону - (⊜) на время, и последние несколько секунд записанной части будут воспроизведены (**просмотр записи**)

Держите нажатой сторону - EDITSEARCH до тех пор, пока видеокамера не дойдет до желаемой сцены. Последняя записанная часть будет воспроизвдена. Для продвижения вперед нажмите сторону + (**монтажный поиск**).



To Begin Re-recording

Press START/STOP. Re-recording begins from the point you released EDITSEARCH. Provided you do not eject the cassette, the transition between the last scene you recorded and the next scene you record will be smooth.

Для начала перезаписи

Нажмите START/STOP. Перезапись начинается от точки, где Вы отпустили EDITSEARCH. Если Вы не вытолкните кассету, переход между последней сценой, которую Вы записали, и следующей сценой, которую Вы записываете, будет плавный.

Connections for Playback

You can use this camcorder as a VCR by connecting it to your TV for playback. It is recommended to use the mains as the power source (p.26).

If a VCR is connected to a TV

Connect the camcorder to LINE IN on the VCR by using the supplied A/V connecting cable. Set the input selector on the VCR to LINE. Set the TV/VCR selector to VCR on the TV.

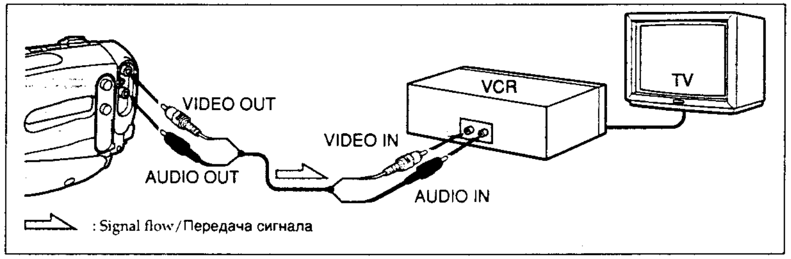
Подключения для воспроизведения

Вы можете использовать данную видеокамеру в качестве КВМ путем подключения ее к Вашему телевизору для воспроизведения. Рекомендуется использовать электрическую сеть в качестве источника питания (стр. 26).

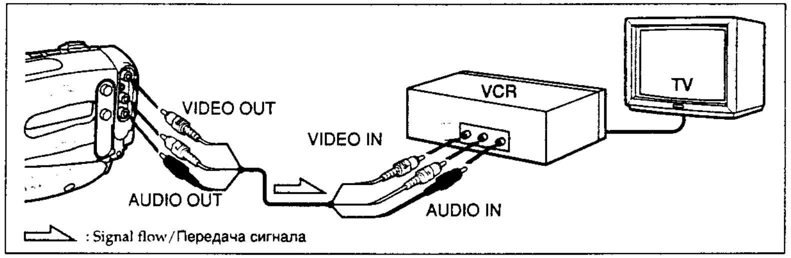
Если КВМ подключен к телевизору

Подключите видеокамеру к LINE IN на КВМ, используя прилагаемый соединительный кабель аудио/видео. Установите входной селектор на КВМ в положение LINE. Установите селектор TV/VCR в положение VCR на телевизоре.

CCD-TR330E/TR440E **CCD-TR330E/TR440E**



CCD-TR490E **CCD-TR490E**



See the next page for further information.

Дальнейшую информацию смотрите на следующей странице.

Connections for Playback

Подключения для воспроизведения

Connecting directly to a TV

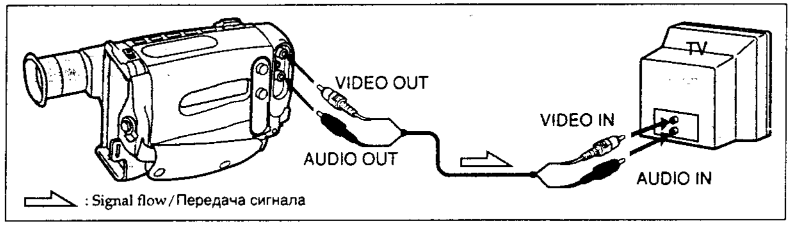
Connect the camcorder to your TV by using the the supplied A/V connecting cable. Set the TV/VCR selector to VCR on the TV.

Подключение непосредственно к телевизору

Подсоедините видеокамеру к Вашему телевизору, используя прилагаемый соединительный кабель аудио/видео. Установите селектор TV/VCR в положение VCR на телевизоре.

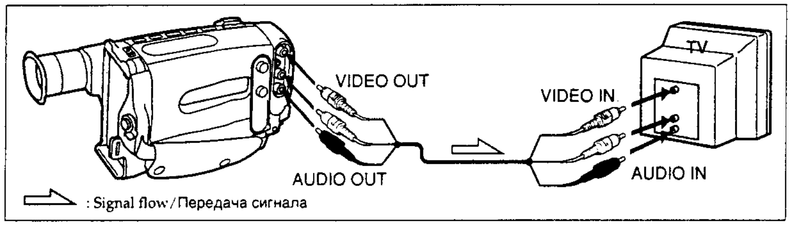
CCD-TR330E/TR440E

CCD-TR330E/TR440E



CCD-TR490E

CCD-TR490E



If your TV or VCR is a monaural type — CCD-TR490E only
Connect only the white plug for audio on both the camcorder and the TV or the VCR. With this connection, the sound is monaural.

To connect a TV or a VCR without Video/Audio input jacks
Use an RFU adaptor (not supplied).

Если Ваш телевизор или КВМ монофонического типа — Только CCD-TR490E
Подсоединить только белый разъем для аудиосигналов и на видеокамере, и на телевизоре или КВМ. При таком соединении звук будет монофоническим.

Для подключения к телевизору или КВМ без входных/выходных гнезд видео/аудио
Выполните подключение с использованием адаптера RFU (не прилагается).

Playing Back a Tape

Воспроизведение ленты

You can monitor the playback picture in the viewfinder. You can also monitor on the TV screen, after connecting the camcorder to the TV/VCR (p.21). You can control playback using the supplied Remote Commander (For CCD-TR440E/TR490E only, p. 65).

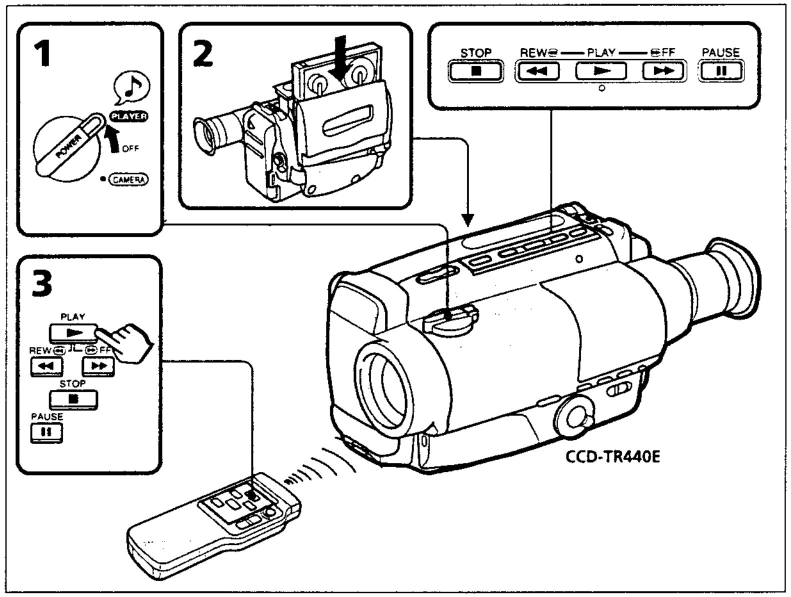
(1) While pressing the small green button on the POWER switch, turn it to PLAYER.
(2) Insert the recorded tape with the window facing out.
(3) Press ►. Playback starts.

♪: You can hear the beep sound to confirm your operation.

Вы можете выполнить контрольный просмотр воспроизводимого изображения в видоискателе. Вы также можете выполнить просмотр на экране телевизора после подключения видеокамеры к телевизору/КВМ (стр. 21). Вы можете управлять воспроизведением, используя прилагаемый пульт дистанционного управления (Только для модели CCD-TR440E/TR490E, стр. 65).

(1) Нажимая маленькую зеленую кнопку на выключателе POWER, передвиньте его в положение PLAYER.
(2) Вставьте записанную ленту окошком, обращенным наружу.
(3) Нажмите ►. Начнется воспроизведение.

♪: Вы можете слышать зуммерный звуковой сигнал для подтверждения Вашей операции.



To stop playback, press ■.
To rewind the tape, press ◄◄.
To fast-forward the tape, press ►►.

See the next page for further information.

Для остановки воспроизведения нажмите ■.
Для ускоренной перемотки ленты назад нажмите ◄◄.
Для ускоренной перемотки ленты вперед нажмите ►►.

Дальнейшую информацию смотрите на следующей странице.

To monitor the sound while viewing the playback picture in the viewfinder
— CCD-TR490E only
Connect headphones (not supplied) to the ∩ jack (p. 61).

Various Playback Modes

To view a still picture (playback pause)
Press ❚❚ during playback. To resume playback, press ❚❚ or ►.

To locate a scene (Picture Search)
Keep pressing ◄◄ or ►► during playback. To resume normal playback, release the button.

To monitor the high-speed picture during fastforward or rewind (Skip Scan)
Keep pressing ◄◄ while rewinding or ►► while advancing the tape. To resume normal playback, press ►.

To view the picture in a sequence of stop-motion images
Press EDITSEARCH in playback pause mode. If you keep pressing EDITSEARCH, you can view the picture playback in the forward (+) or reverse (–) direction.

Notes on playback
- Streaks appear and the sound is muted in the various playback modes.
- When still picture mode lasts for 5 minutes or more, the camcorder automatically enters stop mode.

Для контроля звука во время просмотра воспроизводимого в видоискатеие изображения
— Только для модели CCD-TR490E
Подсоединить головные телефоны (не прилагаются) к гнезду ∩ (стр. 61).

Различные режимы воспроизведения

Для просмотра неподвижного изображения (пауза воспроизведения)
Нажмите кнопку ❚❚ во время воспроизведения. Для возобновления воспроизведения нажмите кнопку ❚❚ или ►.

Для отыскания желаемого фрагмента (поиск изображения)
Держать нажатой кнопку ◄◄ или ►► во время воспроизведения. Для возобновления нормального воспроизведения отпустить кнопку.

Для контроля изображения на высокой скорости во время ускоренной перемотки вперед или назад (поиск методом прогона)
Держать нажатой кнопку ◄◄ во время перемотки ленты назад или кнопку ►► во время перемотки ленты вперед. Для возобновления нормального воспроизведения нажать кнопку ►.

Для просмотра изображения в форме последовательности остановленных кадров
Нажать кнопку EDITSEARCH в режиме паузы воспроизведения. Если Вы будете держать нажатой кнопку EDITSEARCH, Вы сможете просматривать воспроизведение изображения в направлении вперед (+) или в обратном направлении (–).

Примечание к воспроизведению
- В различных режимах воспроизведения на экране могут появиться полосы и звук будет приглушен.
- Если режим неподвижного изображения продолжается около 5 минут или больше, видеокамера автоматически переходит в режим останова.

Using Alternative Power Sources

You can choose any of the following power sources for your camcorder: battery pack (P.7), the mains, and 12/24 V car battery. Choose the appropriate power source depending on where you want to use your camcorder.

Place	Power source	Accessory to be used
Indoors	The mains	Supplied AC power adaptor
Outdoor	Battery pack	Battery pack NP-33 (supplied), NP-55H, NP-C65, NP-67, NP-77H/77HD, NP-98/98D
In the car	12 V or 24 V car battery	DC pack DCP-77

This mark indicates that this product is a genuine accessory for Sony video products. When purchasing Sony video products, Sony recommends that you purchase accessories with this "GENUINE VIDEO ACCESSORIES" mark.

Использование альтернативных источников питания

Вы можете выбирать любой из следующих источников питания для Вашей видеокамеры: батарейный блок (стр. 7), сетевое питание и автомобильный аккумулятор 12/24 В. Выбирайте надлежащий источник питания в зависимости от того, где Вы хотите использовать Вашу видеокамеру.

Место	Источник питания	Используемые принадлежности
В помещении	Электрическая сеть	Прилагаемый сетевой адаптер перем. тока
Вне помещения	Батарейный блок	Батарейный блок NP-33 (прилагается), NP-55H, NP-C65, NP-67, NP-77H/77HD, NP-98/98D
В автомобиле	Автомобильный аккумулятор 12 В или 24 В	Блок пост. тока DCP-77

Этот знак указывает, что данное изделие является подлинной продукцией видеотехники Sony. При покупке видеотехники Sony рекомендуется приобретать изделия с данным знаком "GEUINE VIDEO ACCESSORIES."

Using Alternative Power Sources

Использование альтернативных источников питания

Using the Mains

To use the supplied AC power adaptor:

(1) Connect the mains lead to a wall outlet. Insert the top of the connecting plate of the AC power adaptor into the top of the battery mounting surface. Push the connecting plate so that it attaches firmly.

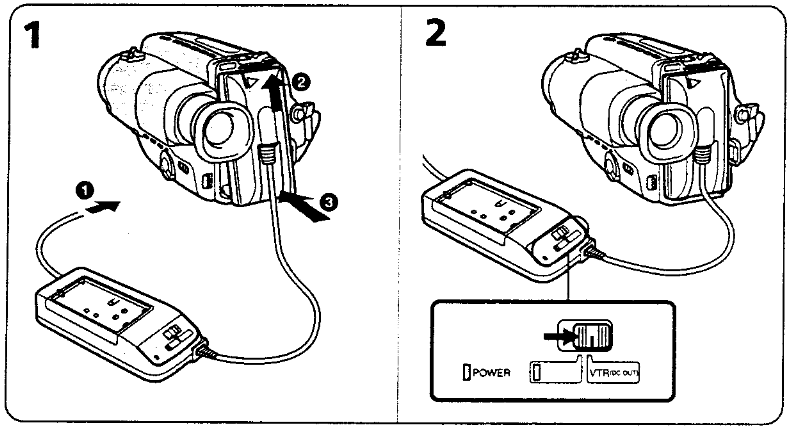
(2) Set the selector to VTR (DC OUT).

Использование электрической сети

Для использования прилагаемого сетевого адаптера перем. тока:

(1) Подсоедините провод электропитания к стенной розетке. Вставьте верхний конец соединительной пластины сетевого адаптера перем. тока в верхнюю часть батарейной установочной поверхности. Нажмите на соединительную пластину, так, чтобы она присоединилась надежно.

(2) Установить селектор в положение VTR (DC OUT).



WARNING
Mains lead must only be changed at qualified service shop.

PRECAUTIONS
The set is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the set itself has been turned off.

ПРЕДУПРЕЖДЕНИЕ
Сетевой провод следует заменять только в мастерской квалифицированного обслуживания.

ПРЕДОСТЕРЕЖЕНИЕ
Данный аппарат не отключается от источника питания перем.тока, пока он соединен со стенной розеткой, даже, если сам аппарат отключен.

Notes on the POWER lamp

- The POWER lamp will remain lit for a while even if the unit is unplugged after use. This is normal.
- If the POWER lamp does not light, set the selector to VTR (DC OUT) and disconnect the mains lead. After about one minute, try again.

To remove the adaptor
The adaptor is removed in the same way as the battery pack (p. 10).

Using a Car Battery

Use the DCP-77 DC pack (not supplied). Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V). Connect the DC pack to the battery mounting surface of the camcorder.

To remove the DC pack
The DC pack is removed in the same way as the battery pack (p. 10).

Примечания к лампочке POWER

- Лампочка POWER будет оставаться горящей какое-то время, даже, если аппарат будет отсоединен после использования. Это является нормальным.
- Если лампочка POWER не загорается, установите селектор в положение VTR (DC OUT) и отсоедините сетевой провод. Через одну минуту попробуйте снова.

Для снятия адаптера
Адаптер снимается таким же образом, как и батарейный блок (стр. 10).

Использование автомобильного аккумулятора

Используйте блок пост. тока DCP-77 (не прилагается). Подсоедините шнур блока пост. тока к гнезду сигаретного прикуривателя автомобиля (12 В или 24 В). Подсоедините блок пост. тока к установочной поверхности батареи видеокамеры.

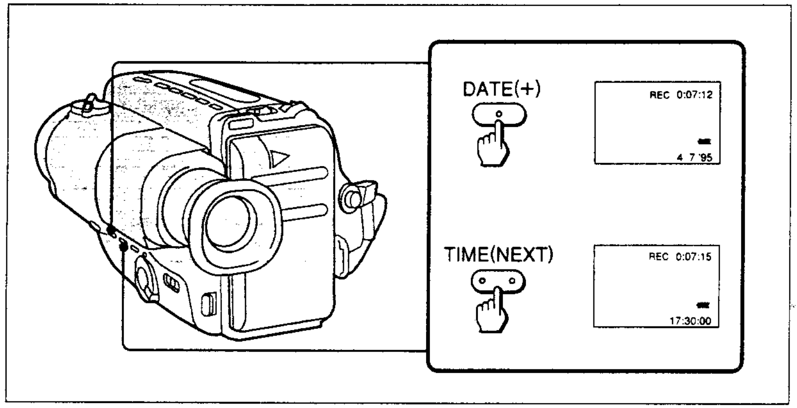
Для снятия блока пост. тока
Блок пост. тока снимается таким же способом, как и батарейный блок (стр. 10).

Recording with the Date or Time

Запись с датой или временем

Before you start recording, press DATE or TIME. You can record the date or time displayed in the viewfinder with the picture. You cannot record the date and time at the same time. Except for the date or time indicator, no indicator in the viewfinder is recorded.
The clock is set to Sydney time for Australia and New Zealand models, to Tokyo time for Japan models and to Hong Kong for other models at the factory.

Перед тем, как Вы начнете запись, нажмите DATE или TIME. Вы можете записать дату или время, отображенное в видоискателе, вместе с изображением. Вы не можете записывать дату и время одновременно. Кроме индикации даты или времени, никакая индикация в видоискателе записываться не будет.
Часы установлены на заводе на время Сиднея для австралийских и новозеландских моделей, на время Токио для японских моделей и на время Гонконга для других моделей.



To Stop Recording with the Date or Time

Press DATE or TIME again. Recording continues.

Для останова записи с датой или временем

Нажмите DATE или TIME снова. Запись продолжится.

Shooting with Backlighting

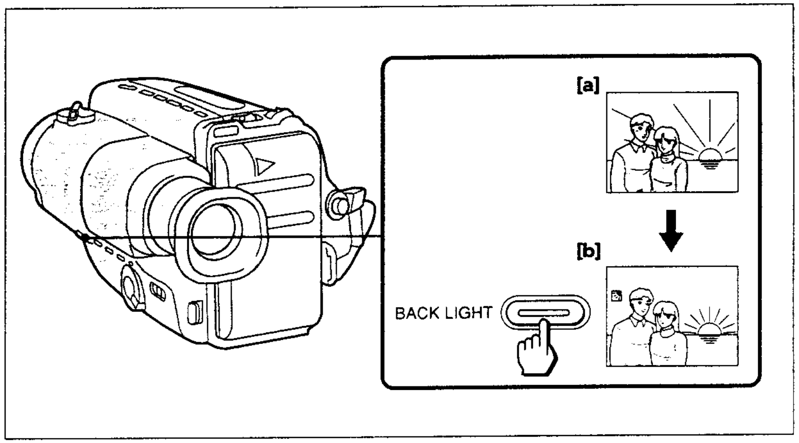
Съемка с задней подсветкой

When you shoot a subject with the light source behind the subject or a subject with a light background, use the BACK LIGHT.

Press BACK LIGHT. The ▣ indicator appears inside the viewfinder.

Если Вы снимаете объект с источником света позади объекта или объект на светлом фоне, используйте BACK LIGHT.

Нажмите BACK LIGHT. В видоискателе появится индикация ▣.



[a] Subject is too dark because of backlight.
[b] Subject becomes bright with backlight compensation.

After Shooting

Press BACK LIGHT again to let the ▣ indicator go out under normal lighting condition.
Otherwise, the picture will be too bright under normal lighting condition.

This function is also effective under following conditions:

- On the snow e.g. at the ski resort
- At the beach under strong sunshine
- A subject with a light source nearby or a mirror reflecting light
- A white subject against a white background. Especially when you shoot a person wearing shiny clothes made of silk or synthetic fiber, his or her face tends to become dark if you do not use this function.

[a] Объект является слишком темным из-за задней подсветки.
[b] Объект становится ярким с компенсацией задней подсветки.

После съемки

Нажмите опять BACK LIGHT, чтобы индикация ▣ исчезла при нормальных условиях освещения.
В противном случае изображение будет слишком ярким при нормальных условиях освещения.

Эта функция также эффективна при следующих условиях:

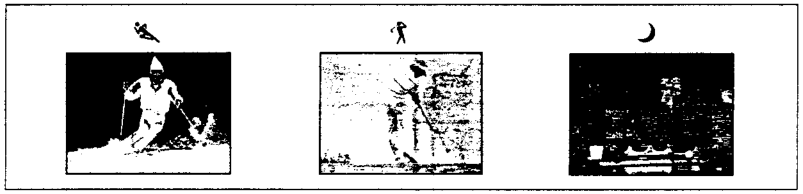
- На фоне снега, например, на лыжном курорте
- На пляже при сильном солнечном свете
- Объект находится рядом с источником света или рядом с зеркалом, отражающим свет
- Белый объект на белом фоне. Особенно, если Вы снимаете человека, который одет в яркую одежду, сделанную из шелка или синтетического волокна, его или её лицо будет становиться темным, если Вы не будете использовать эту функцию.

Using the PROGRAM AE Function

You can select from three PROGRAM AE (Auto Exposure) modes to suit your shooting situation. When you use PROGRAM AE, you can capture high-speed action or night views.

Selecting the Best Mode

Select the best mode by using the following examples.



Sports mode
- Outdoor sports scenes such as football, tennis, golf or skiing
- A landscape in a moving car

High-speed shutter mode
- A golf swing or a tennis match in fine weather with the ball captured clearly
- Playing back certain scenes with high-speed movements in clear, sharp picture

Twilight mode
- Recording night views, neon signs or fireworks

Использование функции PROGRAM AE

Вы можете выбрать один из трех режимов PROGRAM AE (автоматической съемки) в соответствии с Вашей ситуацией. Если Вы используете PROGRAM AE, Вы можете запечатлеть высокоскоростное действие или ночные виды.

Выбор наилучшего режима

Выберите наилучший режим, используя следующие примеры.

Режим спорта
- Спортивные сцены вне помещения, например, футбол, теннис, гольф или лыжи
- Ландшафт из движущегося автомобиля

Режим высокоскоростного затвора
- Взмахи во время игры в гольф или теннис в хорошую погоду с четким запечатлением мяча
- Воспроизведение определенных сцен с высокоскоростными движениями с четким, резким изображением

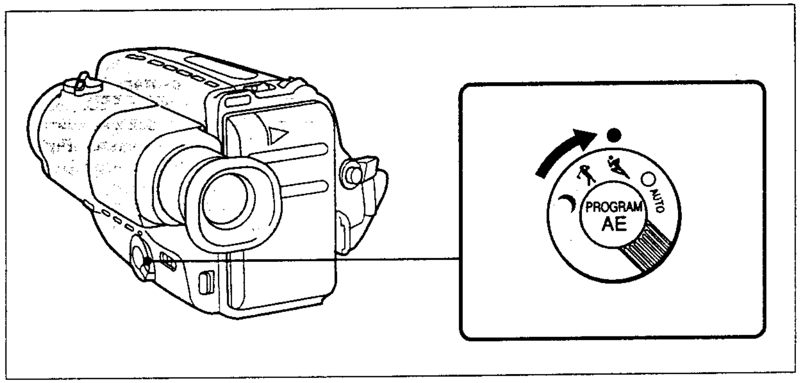
Режим сумерек
- Запись ночных видов, неоновых реклам или фейерверков

Using the PROGRAM AE Function

Set the mark of the desired mode to the ● mark above the PROGRAM AE dial.

Использование функции PROGRAM AE

Установить знак желаемого режима на знак ●, расположенный над диском PROGRAM AE.



Note on shutter speed
The shutter speed in each PROGRAM AE mode is as follows:
Sports mode – between 1/50 to 1/500
High-speed shutter mode – 1/4000
Twilight mode – 1/50
AUTO mode – 1/50

Примечание к скорости затвора
Скорость затвора в каждом режиме PROGRAM AE является следующей:
Спортивный режим — между 1/50 и 1/500
Режим высокоскоростного затвора — 1/4000
Режим сумерок — 1/50
Режим AUTO — 1/50

Shooting Scenery in Several Short Takes

Long, continuous shots of scenery tend to be dull, and have to be edited to make an interesting video. With the 5 SEC. (5-second recording) mode, the camcorder records for about 5 seconds and then switches to Standby mode, so that you will automatically take a series of quick shots resulting in a lively video.

(1) Slide the START/STOP MODE switch to 5 SEC.

(2) Turn STANDBY up and press START/STOP. Recording starts. Five dots appears in the viewfinder.

The dots disappear at a rate of one per second. When five seconds elapse and all the dots disappear, the camcorder switches to Standby mode automatically.

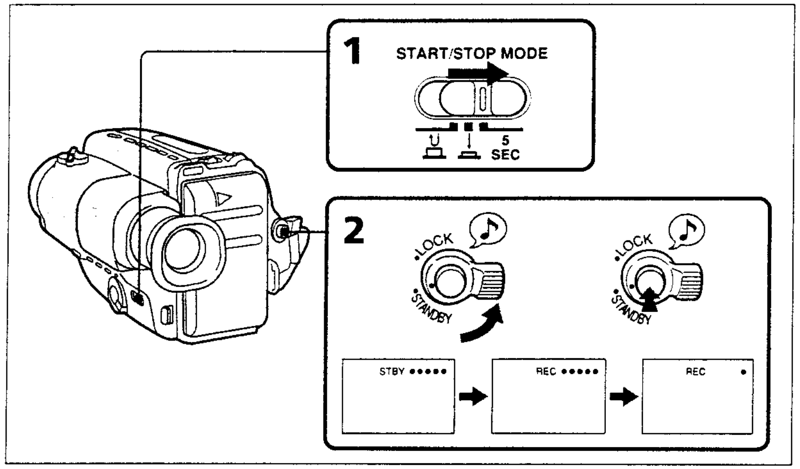
Съемка пейзажа за несколько коротких приемов

Длинные, непрерывные съемки пейзажа имеют тенденцию делаться скучными и должны быть отредактированы, чтобы стать интересой видеопрограммой. С помощью режима 5 SEC (5-секундной записи) видеокамера производит запись приблизительно в течение 5 секунд, а затем переключается на режим готовности, так, что Вы автоматически можете снять серию быстрых кадров, составляющих оживленную видеопрограмму.

(1) Передвиньте переключатель START/STOP MODE в положение 5 SEC.

(2) Поверните STANDBY вверх и нажмите START/STOP. Запись начинается. Пять точек появляется в видоискателе.

Точки исчезают по одной за одну секунду. Когда пять секунд истекут, и все точки исчезнут, видеокамера переключится на режим готовности автоматически.



To Extend the Recording Time

Press START/STOP again before all the dots disappear. Recording continues for about 5 seconds from the moment you press START/STOP.

To Cancel 5-Second Recording

Slide the START/STOP MODE switch to ⏏ (normal recording). If you set the switch while recording, recording continues.

Для продления времени записи

Снова нажмите START/STOP перед тем, как все точки исчезнут. Запись продолжится еще около 5 секунд от момента нажатия START/STOP.

Для отмены 5-секундной записи

Передвиньте переключатель START/STOP MODE в положение ⏏ (нормальная запись). Если Вы установите переключатель во время записи, то запись продолжится.

Superimposing a Title

You can select from nine preset titles to superimpose it on the picture during recording. Each time you press TITLE, the preset titles appear one by one.

To Superimpose from the Beginning

(1) Turn the POWER switch to CAMERA.

(2) Turn STANDBY up.

(3) Press TITLE repeatedly until the desired title appears. The title flashes.

(4) Press START/STOP to start recording.

(5) Press TITLE when you want to turn off the title.

To Superimpose On the Way of Recording

(1) Press TITLE repeatedly until the desired title appears. The title flashes.

(2) When the title stops flashing, press TITLE. The title disappears.

(3) Press START/STOP to start recording.

(4) Press TITLE when you want superimpose the title.

(5) Press TITLE when you want to turn off the title.

Наложение надписи

Вы можете выбирать из девяти предварительно установленных надписей для наложения их на изображение во время записи. Каждый раз, когда Вы нажимаете TITLE, предварительно установленные надписи появляются одна за другой.

Для наложения от начала

(1) Поверните переключатель POWER в положение CAMERA.

(2) Поверните STANDBY вверх.

(3) Неоднократно нажимайте TITLE, пока не появится желаемая надпись. Надпись будет мигать.

(4) Нажмите START/STOP для начала записи.

(5) Нажмите TITLE, когда Вы захотите выключить надпись.

Для наложения в процессе записи

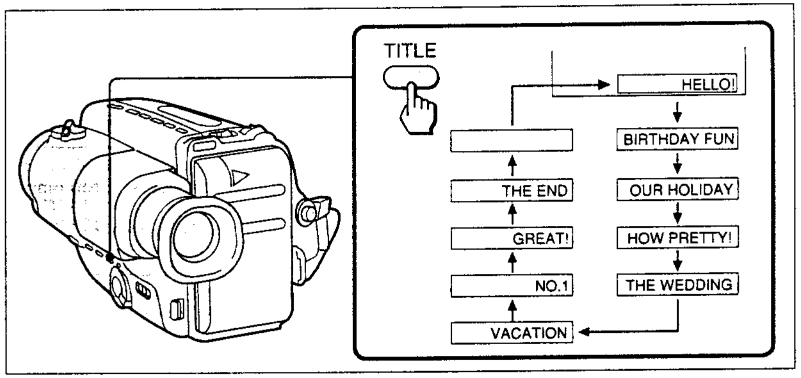
(1) Неоднократно нажимайте TITLE, пока не появится желаемая надпись. Надпись будет мигать.

(2) Когда надпись перестанет мигать, нажмите TITLE. Надпись исчезнет.

(3) Нажмите START/STOP для начала записи.

(4) Нажмите TITLE, когда Вы пожелаете наложить надпись.

(5) Нажмите TITLE, когда Вы захотите выключить надпись.



Note on selecting a title
You cannot select a title during recording.

Примечание к выбору надписи
Вы не можете выбрать надпись во время записи.

Using the Wide Mode Function

Использование функции широкоформатного режима

— CCD-TR490E only

You can record a 16:9 wide picture to watch on the 16:9 wide-screen TV.

Using the Wide Mode Function

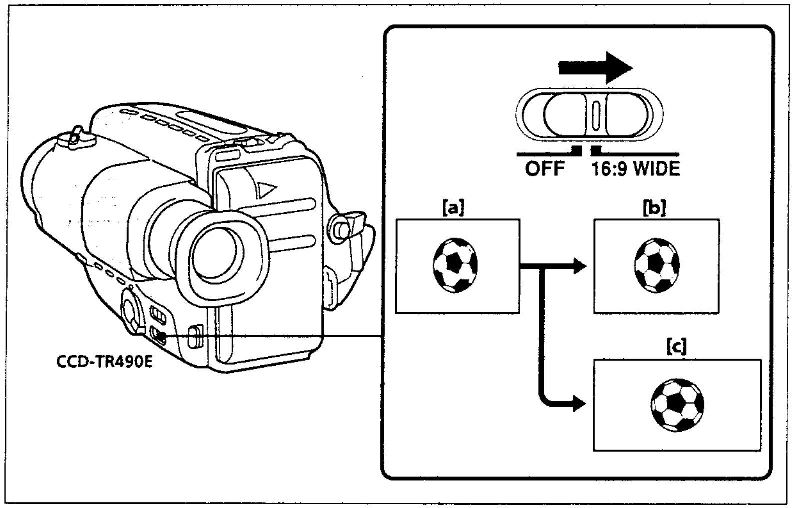
Slide 16:9 WIDE to 16:9 WIDE. The picture in the viewfinder **[a]** or on a normal TV **[b]** is horizontally compressed. You can watch the picture of normal images on a wide-screen TV **[c]**.

— Только CCD-TR490E

Вы можете записывать широкоформатное изображение 16:9 для просмотра на широкоэкранном телевизоре 16:9.

Использование функции широкоформатного режима

Сдвинуть 16:9 WIDE в положение 16:9 WIDE. Изображение в видоискателе **[a]** или на обычном телевизоре **[b]** будет сжато по горизонтали. Вы можете просматривать нормальное изображение на широкоэкранном телевизоре **[c]**.



To Release the Wide Mode

Slide 16:9 WIDE to OFF.

Notes on wide mode

- When you record in 16:9 WIDE mode, the date or time indicator will be windened on the wide-screen TV.
- If you dub a tape, the tape is copied in the same mode as the original recording.

Для выключения функции устойчивой съемки

Передвинуть 16:9 WIDE в положение OFF.

Примечания к широкоформатному режиму

- Если Вы производите запись в режиме 16:9 WIDE, то индикация даты или времени будет расширена на широкоэкранном телевизоре.
- Если Вы перезаписываете ленту, то копия ленты будет выполнена в таком же режиме, как и исходная запись.

Changing the Mode Settings

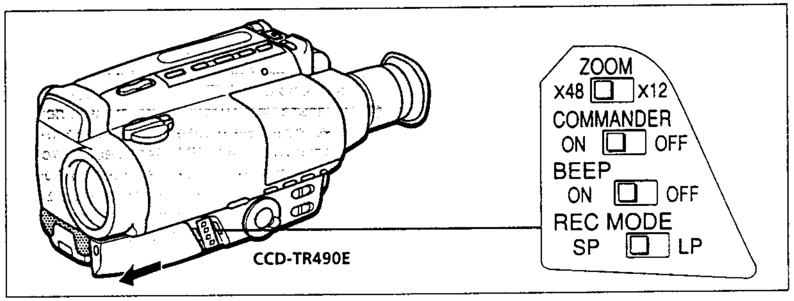
Изменение режимных установок

You can change the mode settings to further enjoy the features and functions.

(1) Slide the cover to the left. You will find the mode switches.
(2) Set the mode switches to the desired mode.
(3) Close the cover.

Вы можете изменять установки режимов для наслаждения дополнительными свойствами и функциями.

(1) Передвиньте крышку влево. Вы увидите переключатели режимов.
(2) Установите переключатели режимов на желаемый режим.
(3) Закройте крышку.



Selecting the Mode Setting of Each Item

ZOOM <x48/x12> (CCD-TR490E only)

- Set to x48 to activate digital zooming.
- Set to x12 otherwise. The zooming ability becomes x12.

COMMANDER <ON/OFF>

- Set to ON when using the supplied Remote Commander for the camcorder (For CCD-TR440E/TR490E only).
- Set to OFF when not using the Remote Commander for the camcorder.

BEEP <ON/OFF>

- Set to ON to turn the beep sound on.
- Set to OFF to turn the beep sound off.

REC MODE <SP/LP>

- Select SP to record a tape in SP (standard play) mode.
- Select LP to record a tape in LP (long play) mode.

Выбор установки режима по каждому пункту

ZOOM <x48/x12> (только для модели CCD-TR490E)

- Установите в положение x48, чтобы задействовать цифровую трансфокацию.
- В других случаях установите в положение x12. Возможность трансфокации становится x12.

ПУЛЬТ УПРАВЛЕНИЯ <COMMANDER ON/OFF>

- Выберите ON, если Вы пользуетесь прилагаемым к видеокамере пультом дистанционного управления (только для CCD-TR440E/TR490E).
- Выберите OFF, если Вы не используете пульт дистанционного управления для видеокамеры.

ЗУММЕРНЫЙ СИГНАЛ <BEEP ON/OFF>

- Установите в положение ON для включения зуммерного звукового сигнала.
- Установите в положение OFF для выключения зуммерного звукового сигнала.

РЕЖИМ ЗАПИСИ <REC MODE SP/LP>

- Выберите SP для записи ленты в режиме SP (стандартного воспроизведения).
- Выберите LP для записи ленты в режиме LP (удлиненного воспроизведения).

Editing onto Another Tape

You can create your own video programme by editing with any other 8 8 mm, Hi8 Hi8, VHS VHS, S-VHS S-VHS, VHSC VHSC, S-VHSC S-VHSC, or β Betamax VCR that has video/audio inputs.

After connecting the camcorder to the VCR (p.21),
(1) Turn the POWER switch to PLAYER.
(2) Insert a blank tape (or a tape you want to record over) into the recording VCR. Then insert your recorded tape into the camcorder.
(3) Play back the recorded tape on the camcorder until you locate the point where you want to start editing. Then set the camcorder to playback pause mode.
(4) Set the recording VCR to recording pause mode.
(5) Press ❚❚ on the camcorder and VCR simultaneously to start editing.

To Edit More Scenes

Repeat steps 3 to 5.

To Stop Editing

Press ■ STOP on the camcorder and VCR.

Use of the EDITSEARCH button
To play back a tape in the forward or reverse direction keep pressing EDITSEARCH during playback pause. You can play back still pictures successively at specific intervals by pressing EDITSEARCH intermittently.

Монтаж на другую ленту

Вы можете создать Вашу собственную видеопрограмму путем монтажа на другой КВМ с 8 8-мм лентой, Hi8 Hi8, лентой VHS VHS, S-VHS S-VHS, VHSC VHSC; S-VHSC S-VHSC или лентой β Betamax, который имеет входы видео/аудио.

После подсоединения видеокамеры к КВМ (стр. 21)
(1) Передвиньте переключатель POWER в положение PLAYER.
(2) Вставьте незаписанную ленту (или ленту, на которую Вы хотите произвести запись) в записывающий КВМ. Затем вставьте Вашу записанную ленту в видеокамеру.
(3) Воспроизводите записанную ленту на видеокамере, пока не отыщете место, где Вы хотите начать монтаж. Затем установите видеокамеру в режим паузы.
(4) Установите записывающий КВМ в режим паузы записи.
(5) Нажмите кнопки ❚❚ на видеокамере и КВМ одновременно для начала монтажа.

Для монтажа большего количества сюжетов

Повторите пункты с 3 по 5.

Для остановки монтажа

Нажмите кнопку ■ STOP на видеокамере и КВМ.

Использование кнопки EDITSEARCH
Для воспроизведения ленты в прямом или обратном направлении держите нажатой кнопку EDITSEARCH во время паузы воспроизведения. Вы можете воспроизводить неподвижные изображения последовательно через определенные интервалы путем периодического нажатия кнопки EDITSEARCH.

Additional Information

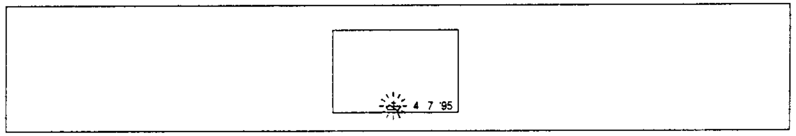
Changing the Lithium Battery In the Camcorder

Your camcorder is supplied with the lithium battery installed. The lithium battery lasts for about 1 year under normal operation. When the battery becomes weak or dead, ⚡ indicator flashes in the viewfinder for about 5 seconds when you set the POWER switch to CAMERA. In this case, **replace the battery with the Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.**

Дополнительная информация

Замена литиевой батарейки в видеокамере

Ваша видеокамера поставляется с установленной литиевой батарейкой. Литиевой батарейки хватает на 1 год при нормальной эксплуатации. Если заряд батарейки ослабевает или батарейка истощается, в видоискателе мигает индикация ⚡ около 5 секунд, когда Вы установите переключатель POWER в положение CAMERA. В данном случае **замените батарейку на новую батарейку Sony CR2025 или Duracell DL-2025. Использование другой батарейки может представлять риск пожара или взрыва.**

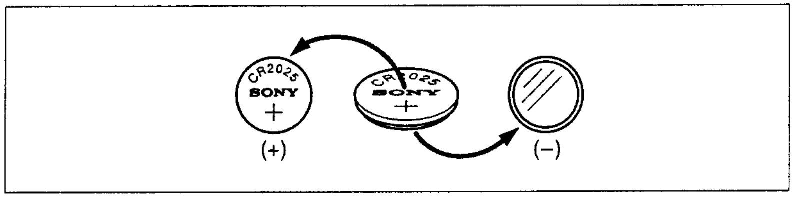


Note on Lithium Battery

Note that the lithium battery has a positive (+) and a negative (–) terminals as illustrated. **Be sure to install the lithium battery so that terminals on the battery match the terminals on the camcorder.**

Примечание по литиевой батарейке

Обратите внимание, что литиевая батарейка имеет положительный (+) и отрицательный (–) полюсы, как показано на рисунке.
Не забудьте установить литиевую батарейку так, чтобы полюсы на батарейке соответствовали полюсам на видеокамере.



WARNING
The battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

Caution
Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.

ПРЕДУПРЕЖДЕНИЕ
Если с батарейкой неправильно обращаться, она может взорваться. Не перезаряжать, не разбирать и не бросать батарейку в огонь.

Предостережение
Храните литиевую батарейку вне доступа от детей. Если кто-нибудь проглотил батарейку, немедленно обратитесь к доктору.

Changing the Lithium Battery In the Camcorder

Замена литиевой батарейки в видеокамере

Changing the Lithium Battery

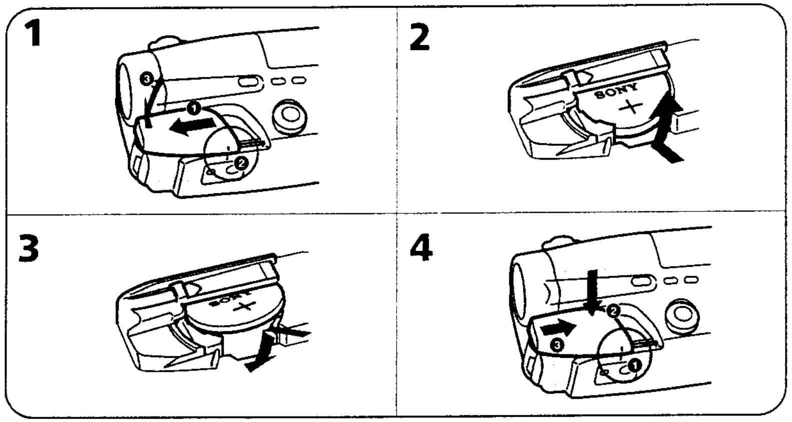
When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you will need to reset the date and time .

(1) Slide the cover and align the mark of the cover to that of the body. Press down the cover.
(2) Push the battery in once and pull it out from the holder.
(3) Install the lithium battery with the positive (+) side facing out.
(4) Align the mark of the cover to that of the body. Press the cover until it clicks and slide the cover.

Замена литиевой батарейки

При замене литиевой батарейки держите батарейный блок или другой источник питания присоединенным. Иначе Вам придется переустанавливать дату и время.

(1) Сдвиньте крышку и совместите метку крышки с меткой корпуса. Нажать крышку вниз.
(2) Нажмите батарейку один раз и выньте ее из держателя.
(3) Установите литиевую батарейку положительной (+) стороной наружу.
(4) Совместите метку крышки с меткой корпуса. Нажмите крышку, пока она не защелкнется и сдвиньте крышку.



Resetting the Date and Time

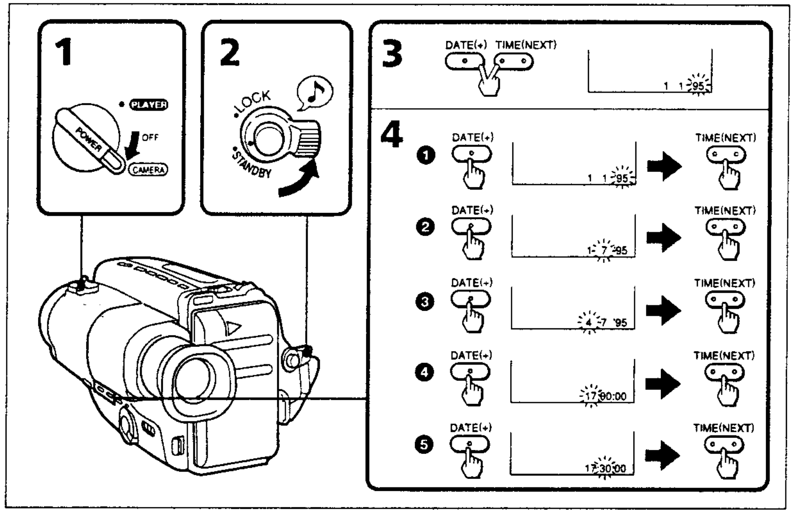
Установка даты и времени

Reset the date and time using the DATE(+) and TIME(NEXT) buttons.

(1) Turn the POWER switch to CAMERA.
(2) Turn STANDBY up.
(3) Press DATE(+) and TIME(NEXT) simultaneously until the year indicator flashes in the viewfinder.
(4) Set year, month, day, time, minute by pressing DATE(+) and TIME(NEXT). Note that when you keep DATE(+) pressed, the digits advance faster.

Установите дату и время, используя кнопки DATE(+) и TIME(NEXT)

(1) Поверните переключатель POWER в положение CAMERA.
(2) Поверните STANDBY вверх.
(3) Одновременно нажимайте DATE(+) TIME(NEXT) до тех пор, пока индикатор года не будет мигать в видоискателе.
(4) Установите год, месяц, день, часы минуты путем нажатия DATE(+) и TIME(NEXT). Обратите внимание, что если Вы держите кнопку DATE(+) нажатой, то цифры возрастают быстрее.



To Correct the Date and Time Setting

Repeat steps 3 and 4.

To Check the Date and Time

Press DATE to display the date indicator in the viewfinder. Press TIME to display the time indicator. When you press the same button again, the indicator goes out.

The year indicator changes as follows:

'95 ⟶ '96 ·········› '24

Для корректировки установки даты и времени

Повторите пункты с 3 по 4.

Для проверки даты и времени

Нажмите DATE для отображения индикации даты в видоискателе. Нажмите TIME для отображения индикации времени. Если снова нажмете ту же кнопку, индикация погаснет.

Индикация года изменяется следующим образом:

'95 ⟶ '96 ·········› '24

Playback Modes

The playback mode is selected automatically according to the recording system (SP/LP mode) in which the tape was recorded.

Notes on AFM Hi-Fi stereo (CCD-TR490E only)
When you play back the tape, the sound is in monaural if:

- You record the tape using this camcorder, then play it back on an AFM Hi-Fi monaural video recorder/player.
- You record the tape on an AFM Hi-Fi monaural video recorder, then play it back on this camcorder.

Foreign 8 mm video
You cannot play software recorded on a different TV colour system. Because the TV colour systems differ from country to country, you may not be able to play back foreign pre-recorded software. Refer to page 52 to check the TV colour system of foreign countries.

Режимы воспроизведения

Режим воспроизведения выбирается автоматически согласно системе записи (режим SP/LP), в которой была записана лента.

Примечания к стереозвучанию AFM Hi-Fi (только для CCD-TR490E)
Когда Вы воспроизводите ленту, звучание будет монофоническим если:

- Вы записали ленту с использованием данной видеокамеры, а затем воспроизводите ее на монофоническом видеомагнитофоне/видеопроигрывателе AFM Hi-Fi.
- Вы записали ленту на монофоническом видеомагнитофоне AFM Hi-Fi, а затем воспроизводите ее на данной видеокамере.

Иностранные видеоленты 8 мм
Вы не сможете воспроизводить программы, записанные в разных системах цветного телевидения. Поскольку системы цветного телевидения изменяются в зависимости от страны, Вы может не сможете воспроизводить иностранные предварительно записанные программы. См. стр. 52 для проверки системы цветного телевидения иностранных государств.

Tips for Using the Battery Pack

This section shows you how you can get the most out of your battery pack.

Preparing the Battery Pack

Always Carry Additional Batteries
Have sufficient battery pack power to do 2 to 3 times as much recording as you have planned.

Battery Life is Shorter in Cold Environment
Battery efficiency is decreased and the battery will be used up more quickly if you are recording in cold environment.

To Save Battery Power
Turn the STANDBY switch on the camcorder down when not recording to save battery power. [a] on page 42.
A smooth transition between scenes can be made even if recording is stopped and started again. While positioning the subject, selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a cassette is inserted or removed.

Советы по использованию батарейного блока

В данном разделе показано, как Вы можете использовать наилучшим образом Ваш батарейный блок.

Подготовка батарейного блока

Всегда носите с собой дополнительные блоки
Имейте достаточное количество заряда в батарейных блоках, чтобы иметь возможность выполнить съемку от 2 до 3 раз.

Срок службы батарейного блока является более коротким в холодных условиях
Эффективность батарейного блока снижается и заряд будет израсходован быстрее, если Вы производите запись в холодных условиях.

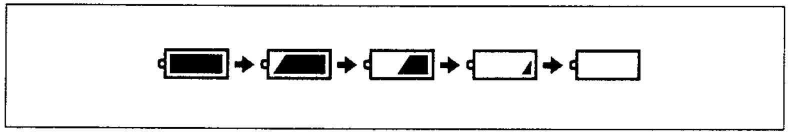
Для сохранения заряда батарейного блока
Для сохранения заряда батарейного блока когда запись не производится, поверните выключатель видеокамеры STANDBY вниз для сохранения заряда батарейного блока. [a] Стр. 42.
Между сценами может быть сделан плавный переход, даже, если запись остановлена и начата опять. Во время позиционирования объекта, выбора угла или просмотра через объектив видоискателя, объектив передвигается автоматически и батарейный блок используется. Батарейный блок также используется, когда вставляется и вынимается кассета.

When to Replace the Battery

While you are using your camcorder in CAMERA mode, the remaining battery indicator decreases gradually as battery power is used up.

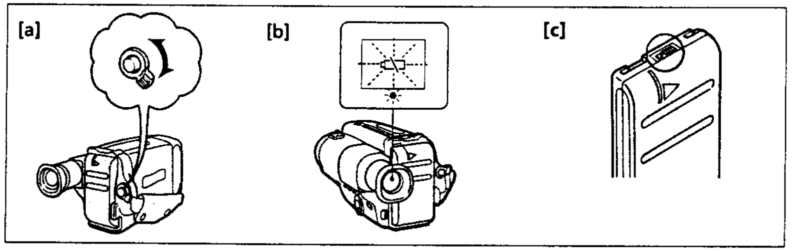
Когда следует заменять батарею

Во время использования Вашей видеокамеры в режиме CAMERA индикатор оставшегося заряда батареи постепенно уменьшается по мере расходования заряда.



When the remaining battery indicator reaches the lowest point, the ▭ indicator appears and starts flashing in the viewfinder. [b]
When the ▭ indicator in the viewfinder changes from slow flashing to rapid flashing while you are recording, turn the POWER switch to OFF on the camcorder and replace the battery pack. Leave the tape in the camcorder to obtain smooth transition between scenes after the battery is replaced.

Если стрелка прибора оставшегося заряда батареи достигает низшей точки, в видоискателе появляется и начинает мигать индикатор ▭. [b]
Если во время записи индикатор ▭ в видоискателе изменяет скорость мигания с медленной на быструю, поверните выключатель POWER в положение OFF на видеокамере и замените батарейный блок. Оставьте ленту в видеокамере для получения плавного перехода между сценами после замены батареи.



Note on the remaining battery indicator
The remaining battery indicator of the camcorder may indicate a different remaining capacity from that of the battery pack with the remaining battery indicator (not supplied). The indicator of the battery pack is more accurate.

Примечание относительно индикатора оставшегося заряда батареи
Индикатор оставшегося заряда батареи видеокамеры может показывать оставшуюся емкость заряда, несколько отличающуюся от той, что показывает батарейный блок с индикатором оставшегося заряда батареи (не прилагается). Индикатор батарейного блока является более точным.

Notes on the Rechargeable Battery Pack

The Battery Heats Up

During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is not cause for concern.

Battery Care

- Remove the battery pack from the camcorder after using the battery pack, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is set to OFF, which shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Therefore, you should charge the battery right before using the camcorder.

How to Use the Switch on the Battery Pack

When the switch is supplied with the battry pack ([c] on page 42), you can use it to find whether the battery pack is charged or not. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up (or in whichever direction you want to remind yourself).

The Life of the Battery Pack

If the ▭ indicator flashes rapidly just after turning on the camcordrer with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Charging Temperature

You should charge batteries at temperatures from 10°C to 30°C (from 50°F to 86°F). Lower temperatures require a longer charging time.

Примечания относительно перезаряжаемого батарейного блока

Батарейный блок нагревается

Во время зарядки или записи батарейный блок нагревается. Это происходит вследствие генерируемой энергии и химических изменений, которые происходят внутри батарейного блока. Это не является причиной для беспокойства.

Уход за батареейным блоком

- Снимите батарейный блок с видеокамеры после пользования и храните его в прохладном месте. Если батарейный блок присоединен к видеокамере, небольшое количество электрического тока будет поступать на видеокамеру, даже, если выключатель POWER установлен в положение OFF, что сокращает срок службы батареи.
- Батарейный блок всегда разряжается, даже, если он не используется после зарядки. Поэтому Вам следует зарядить батарейный блок непосредственно перед использованием видеокамеры.

Как использовать переключатель на батарейном блоке

Если батарейный блок оснащен переключателем ([c] на стр 42), то Вы можете использовать его для определения, заряжен ли батарейный блок или нет. Установите переключатель в позицию "без метки", если батарейный блок полностью заряжен. Установите переключатель в позицию "красной метки", если заряд батарейного блока израсходован (или же в какое-либо другое положение для напоминания).

Срок службы батарейного блока

Если индикатор ▭ быстро мигает сразу после включения видеокамеры с полностью заряженным батарейным блоком, то батарейный блок следует заменить на новый, полностью заряженный.

Температура зарядки

Вам следует заряжать батарейный блок при температуре от 10°C до 30°C (от 50°F до 86°F). При более низкой температуре требуется более длительное время зарядки.

Tips for Using the Battery Pack

Notes on Charging

A Brand-new Battery

A brand-new battery pack is not charged. Before using the battery pack, charge it completely.

After Long Storage

Recharge the battery pack after a long period of storage. If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged. Charge it again, but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Советы по использованию батарейного блока

Примечание по зарядке

Новый батарейный блок

Новый батарейный блок не заряжен. Перед использованием батарейного блока полностью зарядите его.

После длительного хранения

Перезарядите батарейный блок после длительного периода хранения. Если батарейный блок был полностью заряжен, но не использовался длительное время (около 1 года), он разрядится. Зарядите его снова, однако в этом случае срок службы батарейного блока будет короче, чем обычно. После нескольких циклов зарядки и разрядки, срок службы батарейного блока восстановится в соответствии со своей первоначальной емкостью.

Notes on the Terminals

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened. When the terminals are not clean or when the battery pack has not been used for a long time, repeat installing and removing the battery pack. This improves the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.

Be Sure to Observe the Following

- **To prevent an accident caused by a short circuit, do not allow metal objects such as a necklace to touch the battery terminals. Carry the battery pack attaching to the terminal cover. [d]**
- Keep the battery pack away from fire.
- Keep the battery pack dry.
- Do not open nor convert the battery pack.
- Do not expose the battery pack to any mechanical shock.

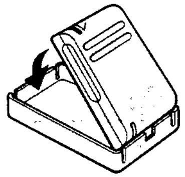
Примечания относительно контактов

Если контакты (металлические части на задней части) загрязнены, срок службы батарейного блока сократится. Если контакты загрязнены или если батарейный блок не использовался длительное время, повторите установку и снятие батарейного блока. Это улучшает состояние контактов. Протрите также контакты + и – мягкой тканью или салфеткой.

Не забудьте соблюдать следующее

- **Для предотвращения несчастного случая, вызванного коротким замыканием, не допускайте, чтобы металлические объекты, такие, как ожерелье, прикасались к контактам батареи. Носите батарейный блок в крышке. [d]**
- Храните батарейный блок вдали от огня.
- Храните батарейный блок в сухом виде.
- Не открывайте и не переделывайте батарейный блок.
- Не подвергайте батарейный блок каким-либо механическим ударным воздействиям.

[d]



Maintenance Information and Precautions

Информация по уходу за аппаратом и предосторожности

Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. If this happens, the tape may stick to the head drum and be damaged or the camcorder may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

Inside the Camcorder

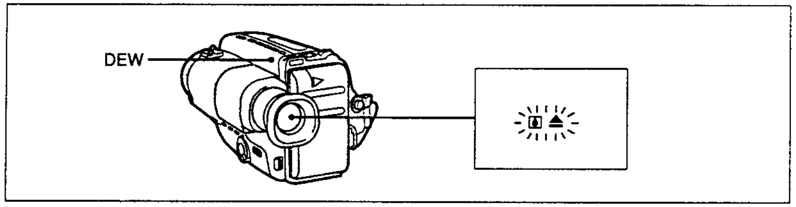
If there is moisture inside the camcorder, the beep sounds and ▣ indicator or the DEW lamp flashes. If this happens, none of the function except cassette ejection will work. Open the cassette compartment, turn off the camcorder, and leave it about 1 hour. When ≜ indicator flashes at the same time, the cassette is inserted in the camcorder. Eject the cassette, turn off the camcorder, and leave also the cassette about 1 hour.

Конденсация влаги

Если видеокамера внесена непосредственно из холодного места в теплое, внутри видеокамеры может конденсироваться влага, а также на поверхности ленты или на объективе. Если это произошло, лента может прилипнуть к барабану головки и будет повреждена или же видеокамера может работать неправильно. Для предотвращения возможного повреждения ввиду таких обстоятельств в видеокамеру встроены датчики влаги. Однако следует выполнить следующие предосторожности.

Внутри видеокамеры

Если внутри видеокамеры произойдет конденсация влаги, то звучит зуммерный сигнал и индикатор ▣ или лампочка DEW будет мигать. Если это случится, то никакая функция, кроме выталкивания кассеты, работать не будет. Откройте отсек кассеты, выключите видеокамеру и оставьте ее приблизительно на 1 час. Когда индикатор ≜ мигает в то же самое время, кассета вставлена в видеокамеру. Вытолкните кассету, выключите видеокамеру и оставьте кассету также приблизительно на 1 час.



On the Lens

No indicator will appear, but the picture becomes dim. Turn off the power and do not use the camcorder for about 1 hour.

How to Prevent Moisture Condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.

(1) Be sure to tightly seal the plastic bag containing the camcorder.

(2) Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about 1 hour).

На объективе

Никакой индикатор появляться не будет, но изображение становится тусклым. Отключите питание и не используйте видеокамеру в течение 1 часа.

Как предотвратить конденсацию влаги

При внесении видеокамеры с холодного места в теплое положите видеокамеру в полиэтиленовый пакет и дайте ей возможность адаптироваться к комнатным условиям в течение определенного периода времени.

(1) Не забудьте герметично завязать полиэтиленовый пакет, содержащий видеокамеру.

(2) Снимите пакет, когда температура внутри него достигнет температуры окружающей среды (примерно спустя 1 час).

Maintenance Information and Precautions

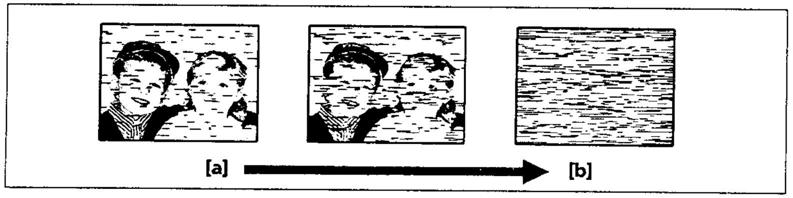
Информация по уходу за аппаратом и предосторожности

Video Head Cleaning

To ensure clear pictures, clean the video heads. When ⊗ appears in the viewfinder in CAMERA mode or playback pictures are "noisy" or hardly visible, the video heads may be contaminated.

Очистка головок

Для обеспечения четкого изображения видеоголовки следует очищать. Если ⊗ появляется в видоискателе или воспроизводимое изображение является "зашумленным" или трудно различимым, видеоголовки могут быть загрязнёнными.



[a] Slight contamination
[b] Critical contamination

If this happens, clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied). After checking the picture, if it is still "noisy", repeat the cleaning. (Do not repeat cleaning more than 5 times.)

Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note

If the V8-25CLH cleaning cassette is not available in your area, consult your nearest Sony dealer.

[a] Незначительное загрязнение
[b] Критическое загрязнение

Если это произошло, очистите видеоголовки с помощью очистительной кассеты V8-25CLH (не прилагается). После проверки изображения, если оно всё ещё "зашумлено", повторите очистку. (Не повторяйте очистку более 5 раз.)

Предостережение

Не используйте имеющиеся в продаже очистительные кассеты влажного типа. Это может повредить видеоголовки.

Примечание

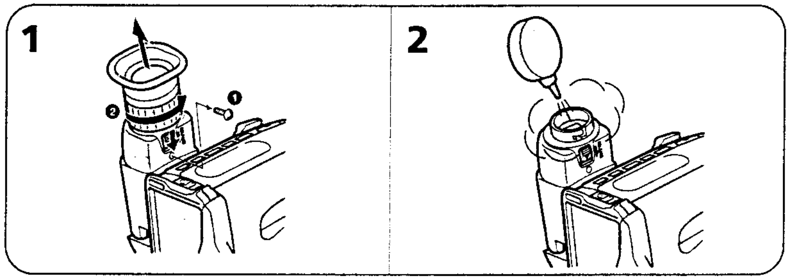
Если очистительной кассеты V8-25CLH нет в продаже в Вашей области, обратитесь в Ваше ближайшее агенство Sony.

Removing Dust from inside the Viewfinder

(1) Remove the screw with a screwdriver (not supplied). Then, while sliding the RELEASE knob, turn the eyecup in the direction of the arrow and pull it out.
(2) Clean the surface with a commercially available blower.

Удаление пыли изнутри видоискателя

(1) Снимите винт с помощью отвертки (не прилагается). Затем передвигая кнопку RELEASE, поверните окуляр в направлении стрелки и снимите его.
(2) Очистите поверхность продувочным устройством, приобретенным коммерческим способом.

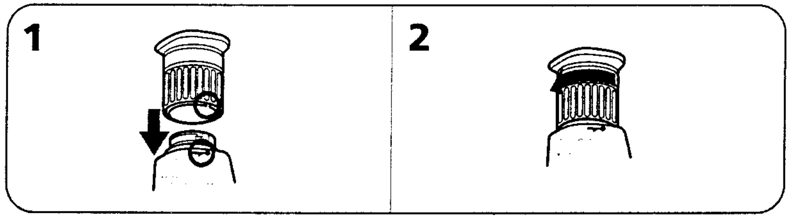


To Reattach the Eyecup

(1) Align the groove on th eyecup with the • mark on the barrel.
(2) Turn the eyecup in the direction of the arrow. Then, replace the screw.

Для прикрепления окуляра

(1) Совместите канавку на окуляре с меткой • на корпусе.
(2) Поверните окуляр в направлении стрелки. Затем установите винт.



Caution

Do not remove any other screws. You may remove only the screws to remove the execup.

Предостережение

Не снимайте каких-либо других винтов. Вы можете снять только винт для снятия окуляра.

Maintenance Information and Precautions

Информация по уходу за аппаратом и предосторожности

Precautions

Camcorder Operation

- Operate the camcorder using 6.0 V (battery pack), or 7.5 V (AC power adaptor).
- For DC or AC operation, use only the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by your nearest Sony dealer before operating it any further.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch set to OFF when not using the camera.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.

On Handling Tapes

Do not insert anything into the small holes on the rear of the cassette. These holes are used to sense the type, thickness of tape, or if the tab is out or in.

Camcorder Care

- When the camcorder is not to be used for a long time, disconnect the power source and remove the cassette. Periodically turn on the power, operate the camera and player sections and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on the lens, remove them with a soft cloth.
- Clean the camcorder body with a soft dry cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Предосторожности

Работа с видеокамерой

- Эксплуатируйте видеокамеру используя 6,0 В (батарейный блок) или 7,5 В (сетевой адаптер перем. тока).
- Для работы от пост. или перем. тока используйте только принадлежности, рекомендуемые в данном руководстве.
- В случае попадания каких-либо твердых предметов или жидкости внутрь корпуса камеры, отключить видеокамеру и проверить ее в ближайшем агентстве Sony перед дальнейшей эксплуатацией.
- Избегайте грубого обращения с видеокамерой или механического ударного воздействия. Будьте особенно осторожны с объективом.
- Держите выключатель POWER в положении OFF, если камера не используется.
- Не заворачивайте видеокамеру и не работайте таким образом с ней, поскольку внутри камеры может подняться температура.
- Держите видеокамеру вдали от сильных магнитных полей или механических вибраций

Относительно обращения с лентами

Не вставляйте никаких предметов в маленькие отверстия на задней стороне кассеты. Эти отверстия используются для определения типа, толщины ленты и наличия лепестка.

Уход за видеокамерой

- Если видеокамера не будет использоваться длительное время, отключите источник питания и извлеките кассету. Периодически включайте питание, производите операции с видеокамерой и секцией плейера и воспроизводите ленту порядка 3минут.
- Очищайте линзу мягкой кисточкой для удаления пыли. Если на поверхности линзы имеются отпечатки пальцев, удалите их с помощью мягкой ткани.
- Очищайте корпус видеокамеры мягкой сухой тканью или же мягкой тканью, слегка смоченной в мягком растворе моющего средства. Не используйте никаких растворителей, поскольку это может повредить отделку.

AC Power Adaptor

Charging

- Use only for the specified battery pack. This unit cannot be used to charge a lithium ion type battery.
- Attach the battery pack firmly.
- Charge the battery pack on a flat surface without vibration.

Others

- Unplug the unit from the wall (mains) outlet when not in use for a long time. To disconnect the cord (mains lead), pull it out by the plug. Never pull the cord itself.
- Do not operate the unit with a damaged cord or if the unit has been dropped or damaged.
- Do not bend the AC power cord (mains lead) forcibly, or put a heavy object on it. This will damage the cord and may cause a fire or an electrical shock.
- Be sure that nothing metallic comes into contact with the metal parts of the connecting plate. If this happens, a short may occur and the unit may be damaged.
- Always keep the metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.
- The unit becomes warm while in use. This is normal.
- Do not place the unit in locations that are:
  - Extremely hot or cold
  - Dusty or dirty
  - Very humid
  - Vibrating

If any difficulty should arise, unplug the unit and contact your nearest Sony dealer.

Сетевой адаптер перем.тока

Зарядка

- Используйте только указанные батарейные блоки. Данный аппарат нельзя использовать для зарядки литиевого ионного типа батарейки.
- Присоедините надежно батарейный блок.
- Заряжайте батарейный блок на плоской поверхности без вибраций.

Прочее

- Отсоедините аппарат от стенной розетки (электросети), если он не будет использоваться длительное время. Для отсоединения шнура (сетевого провода) потяните его за штекер. Никогда не тяните за шнур.
- Не эксплуатируйте аппарат с поврежденным шнуром или же, если аппарат был уронен или поврежден.
- Не сгибайте сетевой шнур перем.тока (сетевой провод) и не кладите тяжелые предметы на него. Это может повредить сетевой шнур и может привести к пожару или поражению электрическим током.
- Следите за тем, чтобы никакие металлические предметы не приходили в контакт с металлическими деталями соединительной пластины. Если это произойдет, то может возникнуть короткое замыкание и аппарат может быть поврежден.
- Всегда поддерживайте металлические контакты в чистоте.
- Не разбирайте аппарат.
- Не подвергайте аппарат механическим ударам и не роняйте его.
- Если аппарат находится в эксплуатации, особенно в режиме зарядки, храните его вдали от приемников AM и видеооборудования, потому что он может нарушить прием AM и работу видеоппаратуры.
- Аппарат становится теплым во время использования. Это является нормальным.
- Не размещайте аппарат в местах, которые:
  - — крайне горячие или холодные
  - — пыльные или грязные
  - — очень влажные
  - — подвержены вибрации

В случае трудностей отсоедините аппарат и обратитесь в Ваше ближайшее агентство Sony.

Using Your Camcorder Abroad

Each country has its own electricity and TV colour systems. Before using your camcorder abroad, check the following points:

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.

Difference in Colour Systems

This camcorder is a PAL system-based camcorder. If you want to view the playback picture on a TV, it must be a PAL system based TV or a SECAM system-based TV with PAL-SECAM transcoder. Check the following alphabetical list.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Germany, Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL M system country
Brazil

PAL N system countries
Argentina, Paraguay, Uruguay

NTSC system countries
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

SECAM system countries
Bulgaria, Czech Republic, France, Guyana, Hungary, Iran, Iraq, Monaco, Poland, Russia, Slovak Republic, Ukraine, etc.

Использование Вашей видеокамеры за рубежом

Каждая страна имеет свою собственную систему электрической сети и систему цветного телевидения. Перед использованием Вашей видеокамеры за рубежом проверьте следующие пункты:

Источники питания

Вы можете использовать Вашу видеокамеру в любой стране с прилагаемым сетевым адаптером перем.тока в пределах от 110 В до 240 В перем.тока, 50/60 Гц.

Различия в системах цветного телевидения

Данная видеокамера основана на системе PAL. Если Вы хотите воспроизводить изображение на телевизоре, он должен быть основан на системе PAL или же на системе SECAM с транскодером PAL-SECAM. Проверьте следующий список, составленный в алфавитном порядке.

Страны с системой PAL
Австралия, Австрия, Бельгия, Великобритания, Германия, Голландия, Гонконг, Дания, Испания, Италия, Китай, Кувейт, Малайзия, Новая Зеландия, Норвегия, Португалия, Сингапур, Таиланд, Финляндия, Швеция, Швейцария, и др.

Страны с системой PAL-M
Бразилия

Страны с системой PAL-N
Аргентина, Парагвай, Уругвай

Страны с системой NTSC
Багамские острова, Боливия, Венесуэла, Канада, Колумбия, Корея, Мексика, Перу, Суринам, США, Тайвань, Филиппины, Центральная Америка, Чили, Эквадор, Ямайка, Япония и др.

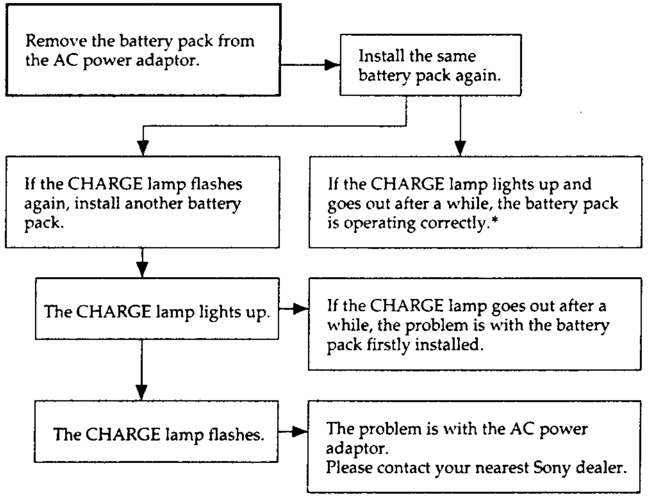
Страны с системой SECAM
Болгария, Венгрия, Гайана, Ирак, Иран, Монако, Польша, Россия, Словацкая Республика, Украина, Франция, Чешская Республика и др.

AC Power Adaptor

	Symptom	Cause	Corrective Actions	page
AC power adaptor	The POWER lamp does not light.	—	Set the selector to VTR (DC OUT) and disconnect the mains lead. After about one minute, try again.	9
	The CHARGE lamp flashes.	See the following chart.		

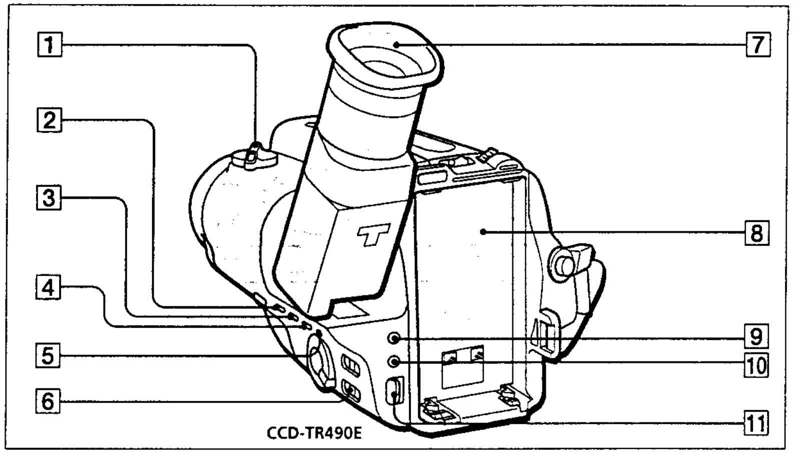
When the CHARGE Lamp Flashes

Check through the following chart.


Remove the battery pack from the AC power adaptor.
Install the same battery pack again.
If the CHARGE lamp flashes again, install another battery pack.
If the CHARGE lamp lights up and goes out after a while, the battery pack is operating correctly.*
The CHARGE lamp lights up.
If the CHARGE lamp goes out after a while, the problem is with the battery pack firstly installed.
The CHARGE lamp flashes.
The problem is with the AC power adaptor.
Please contact your nearest Sony dealer.

* If you use a battery pack which you have just bought or which has been left unused for a long time, the CHARGE lamp may flash at the first charging. But this is not a problem. Repeat again to charge with the same battery pack.

Identifying the Parts Наименование деталей



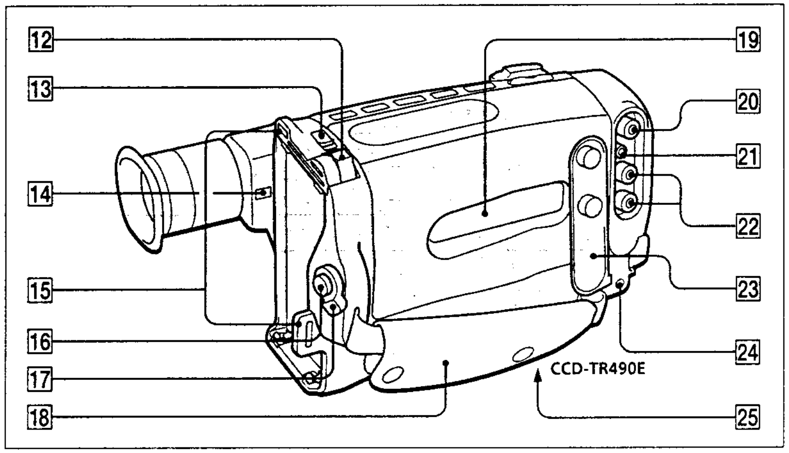
CCD-TR490E

1. **POWER switch (p.12, 23)**
2. **DATE (+) button (p.28, 39)**
3. **TIME (NEXT) button (p.28, 39)**
4. **TITLE button (p.33)**
5. **COUNTER RESET button (p.15)**
6. **16:9 WIDE mode switch (p.34)**
   For CCD-TR490E only
7. **Eyecup (p.18, 49)**
8. **Battery mounting surface (p.10)**
9. **LANC Ⓛ control jack**
   Connect the LANC Ⓛ connecting cable to a wired remote control unit such as an editing controller. In this case, set the COMMANDER mode to OFF (p. 35).
   Ⓛ stands for Local Application Control Bus sytem. The Ⓛ control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the connectors indicated as CONTROL L or REMOTE.
10. **∩ (headphones) jack (p.24)**
    For CCD-TR490E only
11. **BATT (battery) release knob (p.10)**

1. **Выключатель POWER (стр. 12, 23)**
2. **Кнопка DATE (+) (стр. 28, 39)**
3. **Кнопка TIME (NEXT) (стр. 28, 39)**
4. **Кнопка TITLE (стр. 33)**
5. **Кнопка COUNTER RESET (стр. 15)**
6. **Переключатель режима 16:9 WIDE (стр. 34)**
   Только для CCD-TR490E
7. **Окуляр (стр. 18, 49)**
8. **Батарейная установочная поверхность (стр. 10)**
9. **Гнездо управления LANC Ⓛ**
   Подключите кабель LANC Ⓛ к пульту проводного дистанционного управления, используемого в качестве дополнительного органа управления. В этом случае установите режим COMMANDER в положение OFF (стр. 35).
   Ⓛ означает систему канала местного управления. Гнездо управления Ⓛ используется для контроля за перемещением ленты видеооборудования и периферийных устройств, подключенных к нему. Данное гнездо имеет такую же функцию, как и разъемы, обозначенные как CONTROL L или REMOTE.
10. **Гнездо ∩ (головных телефонов) (стр. 24)**
    Только для модели CCD-TR490E
11. **Кнопка освобождения BATT (батарейного блока) (стр.10)**

Identifying the Parts

Наименование деталей



12 Power zoom lever (p.16)

13 EJECT knob (p.11)

14 Eyecup release knob (p.49)

15 Hooks for shoulder strap (p.64)

16 START/STOP button (p.12, 13)

17 STANDBY switch (p.12, 13)

18 Grip strap (p.18)

19 Cassette compartment (p.11)

20 VIDEO OUT jack (p.21)

21 RFU DC OUT (RFU adaptor DC out) jack

22 AUDIO OUT jack (p.21)

23 Jack cover

24 **MIC (microphone) jack**
Connect an optional external microphone. This jack also accepts a "plug-in-power" microphone.

25 **Tripod receptacle (p.19)**
Attach a tripod (not supplied) here.
When attaching a non-Sony tripod, make sure that the length of the camera mounting screw is shorter than 6.5 mm (9/32 inches). Otherwise, the screw might damage the inner part of the camcorder.

12 Рычаг приводного трансфокатора (стр. 16)

13 Кнопка EJECT (стр. 11)

14 Кнопка освобождения окуляра (стр. 49)

15 Крючки для плечевого ремня (стр. 64)

16 Кнопка START/STOP (стр. 12, 13)

17 Переключатель STANDBY (стр. 12, 13)

18 Ремень захвата (стр. 18)

19 Отсек кассеты (стр. 11)

20 Гнездо VIDEO OUT (стр. 21)

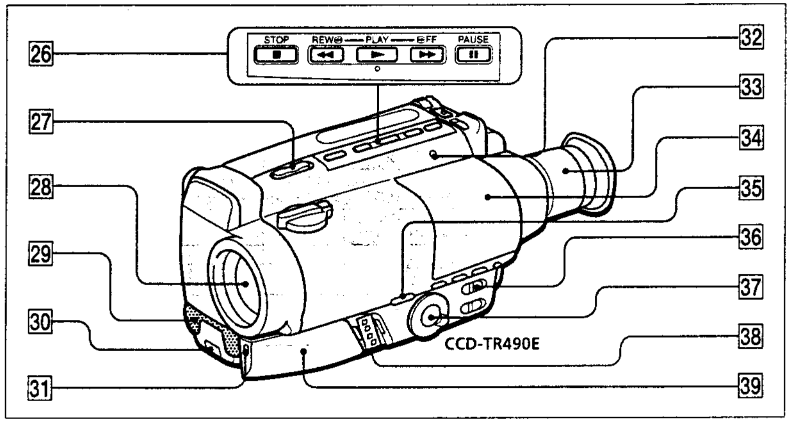
21 Гнездо RFU DC OUT (выход адаптера пост.тока RFU)

22 Гнездо AUDIO OUT (стр. 21)

23 Крышка гнезда

24 **Гнездо MIC (микрофна)**
Подсоедините факультативный внешний микрофон. Это гнездо также подходит для подключения микрофона с "включением питания".

25 **Держатель треножника (стр. 19)**
Присоедините треножник (не прилагается) здесь. При подсоединении треножника фирмы, отличной от Sony, убедитесь, что длина установочного винта видеокамеры короче 6,5 мм. В противном случае винт может повредить внутреннюю часть видеокамеры.



26 **Tape transport buttons (p.23, 24)**
■ STOP
◀◀ REW (rewind)
▶ PLAY (playback)
▶▶ FF (fast forward)
❚❚ PAUSE
These buttons will function in PLAYER mode.

27 EDITSEARCH button (p.20)

28 Lens cover

29 Built-in microphone

30 Remote sensor (p.67)

31 Camera recording/battery lamp

32 DEW lamp (p.46)

33 Viewfinder adjustment ring (p.13)

34 Viewfinder (p.13, 49, 69)

35 BACK LIGHT button (p.29)

36 START/STOP MODE switch (p.12, 14, 32)

37 PROGRAM AE dial (p.31)

38 Mode switches (p.35)

39 Lithium battery compartment (p.38)

26 **Кнопки перемещения ленты (стр. 23, 24)**
■ STOP (останов)
◀◀ REW (перемотка назад)
▶ PLAY (воспроизведение)
▶▶ FF (перемотка вперед)
❚❚ PAUSE (пауза)
Эти кнопки будут функционировать в режиме PLAYER.

27 Кнопка EDITSEARCH (стр. 20)

28 Крышка объектива

29 Встроенный микрофон

30 Дистанционный датчик (стр. 67)

31 Запиысь видеокамеры/лампочка батарейного блока

32 Лампочка DEW (стр. 46)

33 Кольцо регулировки видоискателя (стр.13)

34 Видоискатель (стр. 13, 49, 69)

35 Кнопка BACK LIGHT (стр. 29)

36 Переключатель START/STOP MODE (стр. 12, 14, 32)

37 Диск PROGRAM AE (стр. 31)

38 Переключатели режимов (стр. 35)

39 Отсек литиевой батарейки (стр. 38)

Identifying the Parts

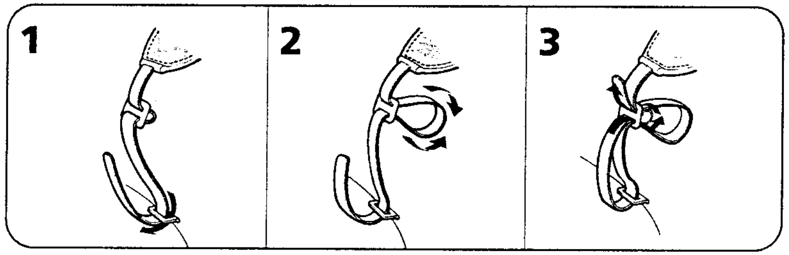
Наименование деталей

Attaching the shoulder strap

Attach the supplied shoulder strap to the hooks for the shoulder strap (15 on page 62).

Прикрепление плечевого ремня

Прикрепите прилагаемый плечевой ремень к крючку для плечевого ремня (15 на стр. 62).



Remote Commander

— CCD-TR440E/TR490E only

Using the Remote Commander

Make sure that the COMMANDER mode is set to ON (p. 35).

The buttons that have the same name on the Remote Commander and on the camcorder function identically.

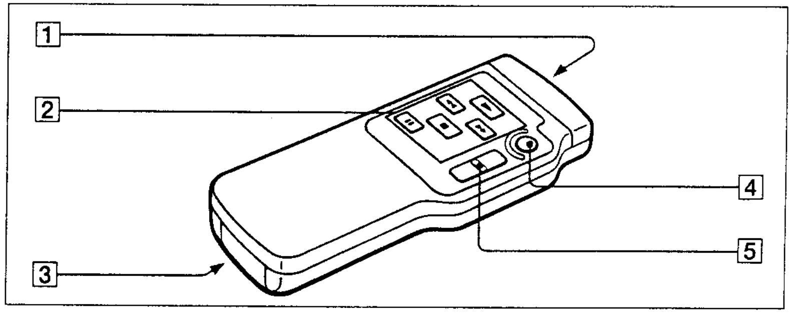
Пульт дистанционного управления

— Только CCD-TR440E/TR490E

Использование пульта дистанционного управления

Убедитесь, что режим COMMANDER установлен в положение ON (стр.35).

Кнопки с одинаковыми названиями на пульте дистанционного управления и на видеокамере функционируют идентично.



1 **Transmitter**
Point toward the remote sensor to control the camcorder after turning on the POWER switch on the camcorder.

2 **Tape transport buttons (p.23, 24)**

3 **R6 (size AA) battery holder (p.66)**

4 **START/STOP button**

5 **Power zoom button**
The zooming speed is unchangeable on the Remote Commander.

1 **Передатчик**
Направьте его на дистанционный датчик для управления видеокамерой после включения питания с помощью выключателя POWER на видеокамере.

2 **Кнопки перемещения ленты (стр. 23, 24)**

3 **Держатель батареек R6 (размер AA) (стр. 66)**

4 **Кнопка START/STOP**

5 **Кнопка приводной трансфокации**
Скорость трансфокации является неизменной при управлении с помощью пульта дистанционного управления.

Identifying the Parts

Наименование деталей

Preparing the Remote Commander

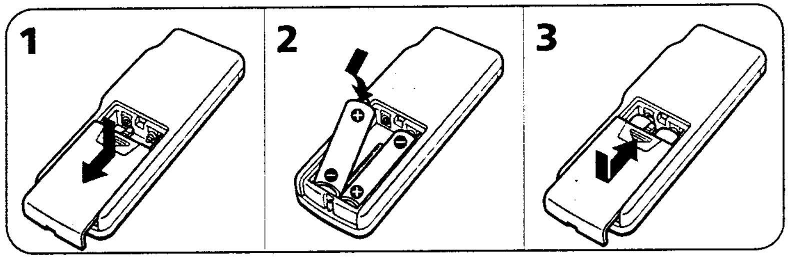
To use the Remote Commander, you must insert two R6 (size AA) batteries. Use the supplied R6 (size AA) batteries.

(1) Remove the battery cover from the Remote Commander.
(2) Insert both of the R6 (size AA) batteries with correct polarity.
(3) Put the battery cover back onto the Remote Commander.

Подготовка пульта дистанционного управления

Для использования пульта дистанционного управления Вы должны вставить две батарейки R6 (размером AA). Воспользуйтесь прилагаемыми батарейками R6 (размером AA).

(1) Снимите крышку отсека батареек с пульта дистанционного управления.
(2) Вставьте обе батарейки R6 (размером AA) с правильной полярностью.
(3) Установите крышку на пульт дистанционного управления.



Note on battery life

The batteries for the Remote Commander last about 6 months under normal operation. When the batteries become weak or dead, the Remote Commander does not work.

To avoid damage from possible battery leakage

Remove the batteries when you will not use the Remote Commander for a long time.

Примечание относительно срока службы батареек

Батареек для пульта дистанционного управления хватает примерно на 6 месяцев при нормальной эксплуатации. Если заряд батареек станет слабым или израсходуется совсем, пульт дистанционного управления перестанет функционировать.

Во избежание повреждения вследствие возможной утечки содержимого батареек

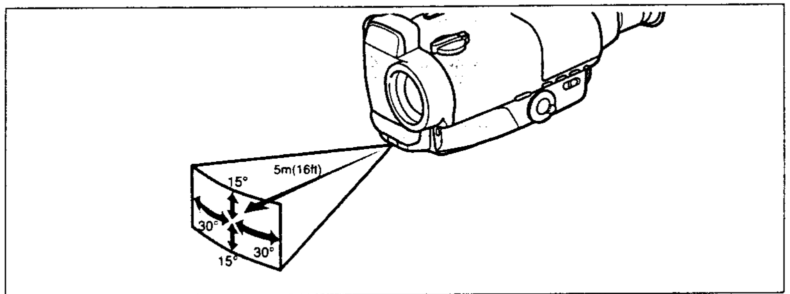
Удалите батарейки, если Вы не будете использовать пульт дистанционного управления длительное время.

Remote Control Direction

Aim the Remote Commander to the remote sensor within the range as shown below.

Направление пульта дистанционного управления

Направьте пульт дистанционного управления на дистанционный датчик в пределах диапазона, показанного ниже.



Notes on the Remote Commander

- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Otherwise, the remote control may not be effective.
- Be sure that there is no obstacle between the remote sensor and the Remote Commander.
- This camcorder works at commander mode VTR 2. The commander modes (1, 2, and 3) are used to distinguish this camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR at commander mode VTR 2, we recommend you change the commander mode or cover the remote sensor of the VCR with black paper.

Примечания относительно пульта дистанционного управления

- Располагайте дистанционный датчик вдали от сильных источников света, таких, как прямой солнечный свет или иллюминация. В противном случае дистанционное управление может не срабатывать.
- Убедитесь, что между дистанционным датчиком и пультом управления нет препятствия.
- Данная видеокамера работает в режиме пульта управления VTR 2 (КВМ 2). Режимы пульта управления (1,2 и 3) используются для отличия данной видеокамеры от других КВМ фирмы Sony, чтобы избежать неправильного срабатывания при дистанционном управлении. Если Вы используете другие КВМ фирмы Sony в режиме пульта управления VTR 2 (КВМ 2), рекомендуется изменить режим на пульте управления или закрыть дистанционный датчик КВМ черной бумагой.

To Watch the Demonstration

You can watch a brief demonstration of pictures with titles.

If the demonstration appears when you turn on the camcorder for the first time, exit the Demo mode to use your camcorder.

To enter Demo mode

(1) Eject the cassette and turn the POWER switch to OFF.
(2) Turn STANDBY up.
(3) While holding down ▶ PLAY, turn the POWER switch to CAMERA. Demonstration starts. The demonstration stops when you insert the cassette.

Note that once you enter Demo mode, this mode is retained as long as the lithium battery is in place. Therefore, demonstration starts automatically 10 minutes later every time you turn the POWER switch to CAMERA, or after you eject the cassette.

To exit Demo mode

(1) Turn the POWER switch to OFF.
(2) Turn STANDBY up.
(3) While holding down ■ STOP, turn the POWER switch to CAMERA.

Для просмотра демонстрации

Вы можете просмотреть короткую демонстрацию изображений с надписями.
Если демонстрация появляется, когда Вы используете видеокамеру в первый раз, то требуется выйти из демонстрационного режима для использования видеокамеры.

Для входа в демонстрационный режим

(1) Вытолкните кассету и поверните выключатель POWER в положение OFF.
(2) Поверните STANDBY вверх.
(3) Нажимая ▶ PLAY, поверните выключатель POWER в положение CAMERA. Демонстрация начинается. Демонстрация заканчивается, когда Вы вставите кассету.

Обратите внимание, что если Вы ввели демонстрационный режим, то этот режим сохраняется до тех пор, пока установлена литиевая батарейка. Таким образом, демонстрация каждый раз автоматически начинается через 10 минут после того, как Вы повернете выключатель POWER в положение CAMERA или после выталкивания кассеты.

Для выхода из демонстрационного режима

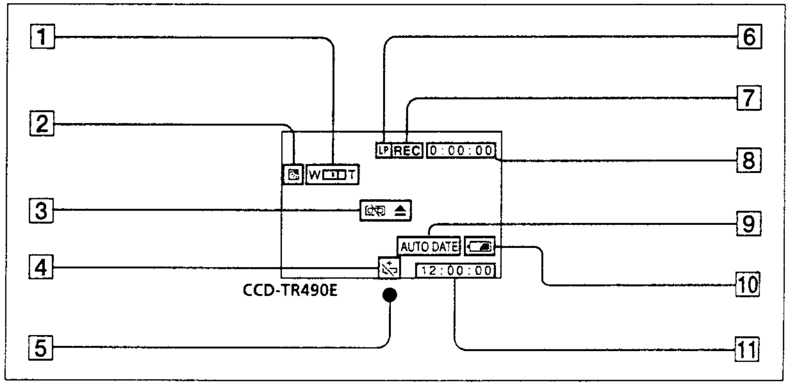
(1) Поверните выключатель POWER в положение OFF.
(2) Поверните STANDBY вверх.
(3) Нажимая ■ STOP, поверните выключатель POWER в положение CAMERA.

In the Viewfinder

The indicators appear in CAMERA mode only.

В видоискателе

Индикаторы появляются только в режиме CAMERA.



1 **Power zoom indicator (p.17)**
For CCD-TR490E only

2 **Backlight indicator (p. 29)**

3 **Warning indicator (p. 70)**

4 **Lithium battery indicator (p. 37)**

5 **Recording lamp/battery lamp (p. 12)**

6 **Recording in LP mode (p. 12)**

7 **Tape transport mode (p. 12)**

8 **Tape counter (p. 15)**

9 **AUTO DATE indicator (p. 12)**

10 **Remaining battery indicator (p. 42)**

■ → ▰ → ▰ → ▱ → □

11 **Date, Time or Title (p. 28, 33)**

1 **Индикатор приводного трансфокатора (стр. 17)**
Только для CCD-TR490E

2 **Индикатор задней подсветки (стр. 29)**

3 **Предупреждающий индикатор (стр. 70)**

4 **Индикатор литиевой батарейки (стр. 37)**

5 **Лампочка записи/лампочка батарейного блока (стр. 12)**

6 **Запись в режиме LP (стр. 12)**

7 **Режим перемещения ленты (стр. 12)**

8 **Счетчик ленты (стр. 15)**

9 **Индикатор AUTO DATE (стр. 12)**

10 **Индикатор оставшегося заряда батарейного блока (стр. 42)**

■ → ▰ → ▰ → ▱ → □

11 **Дата, время или надпись (стр. 28, 33)**

Warning Indicators

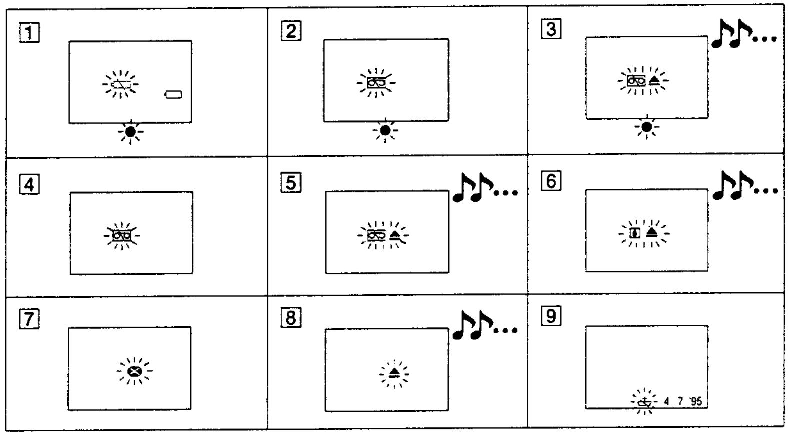
Предупреждающие индикаторы

All indicators appear only when you use the camcorder in CAMERA mode. If indicators flash in the viewfinder, or a caution lamp on the camcorder flashes, check the following:

♪: You can hear the beep sound when BEEP is set to ON (p. 35).

Все индикаторы появляются только тогда, когда Вы используете видеокамеру в режиме CAMERA. Если в видоискателе мигают индикаторы или на видеокамере мигает сигнальная лампочка, проверьте следующее:

♪: Вы можете слышать зуммерный звуковой сигнал при установке BEEP в положение ON (стр. 35).



1 Battery Remaining
Slow flashing: The battery is weak.
Fast flashing: The battery is dead.

2 The tape is near the end.

3 The tape has run out.

4 No tape has been inserted.

5 The tab on the tape is out (red) (p.11).

1 Оставшийся заряд батареи
Медленное мигание: заряд батареи слабый.
Быстрое мигание: заряд батареи израсходован.

2 Лента приближается к концу.

3 Лента закончилась.

4 Не вставлена кассета.

5 На кассете отсутствует лепесток предохранения записи от стирания (красный) (стр. 11).

6 Moisture condensation has occurred (p.46).
≜ indicator appears only when the cassette is inserted.

7 The video heads may be contaminated (p.48).

8 Some other trouble has occurred.
Disconnect the power source and contact your Sony dealer or local authorized facility.

9 The lithium battery is weak or the lithium battery is not installed (p. 37).
This indicator flashes just only after powering on.

6 Произошла конденсация влаги (стр. 46).
Индикатор ≜ появляется только при вставленной кассете.

7 Возможно загрязнены видеоголовки (стр. 48).

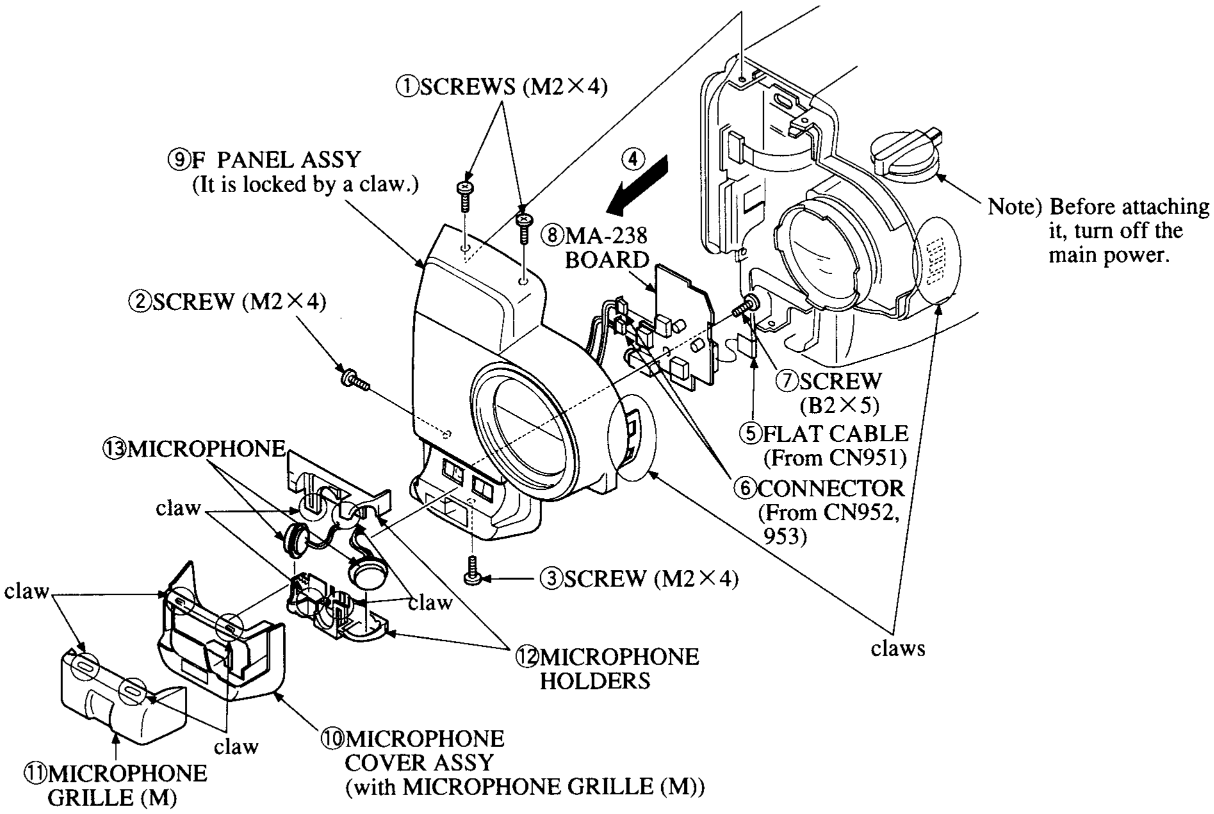
8 Имеют место другие неисправности.
Отсоедините источник питания и обратитесь в Ваше агентство фирмы Sony или местное уполномоченное ремонтное предприятие.

9 Заряд литиевой батарейки является слабым или же литиевая батарейка не установлена (стр. 37).
Этот индикатор мигает только после включения питания.

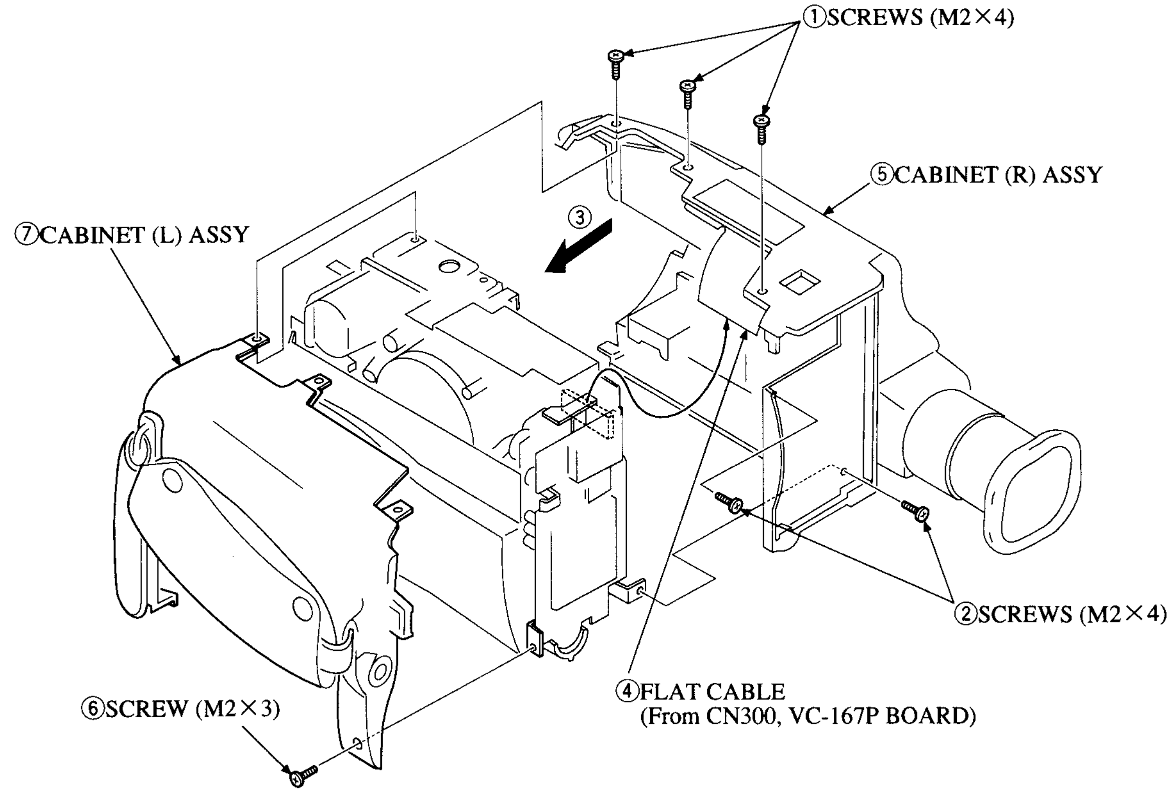
SECTION 2
DISASSEMBLY

NOTE : Follow the disassembly procedure in the numerical order given.

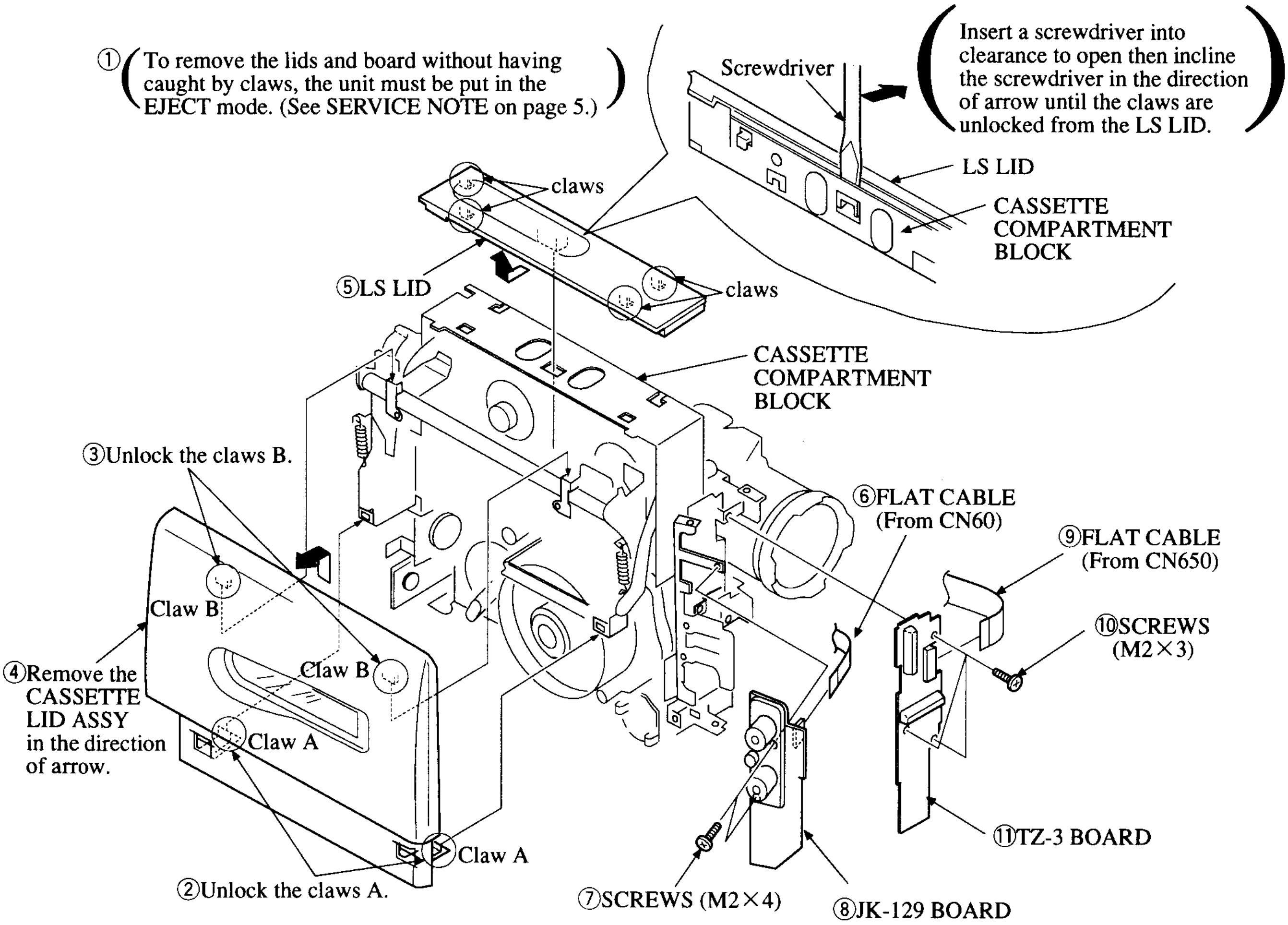
2-1. REMOVAL OF F PANEL ASSY, MA-238 BOARD and MICROPHONE


①SCREWS (M2×4)
⑨F PANEL ASSY
(It is locked by a claw.)
④
⑧MA-238 BOARD
Note) Before attaching it, turn off the main power.
②SCREW (M2×4)
⑦SCREW (B2×5)
⑤FLAT CABLE (From CN951)
⑬MICROPHONE
⑥CONNECTOR (From CN952, 953)
claw
claw
③SCREW (M2×4)
claw
⑫MICROPHONE HOLDERS
claws
claw
⑩MICROPHONE COVER ASSY (with MICROPHONE GRILLE (M))
⑪MICROPHONE GRILLE (M)

2-2. REMOVAL OF CABINET ASSY


①SCREWS (M2×4)
⑤CABINET (R) ASSY
③
⑦CABINET (L) ASSY
②SCREWS (M2×4)
④FLAT CABLE (From CN300, VC-167P BOARD)
⑥SCREW (M2×3)

2-3. REMOVAL OF CASSETTE LID ASSY, LS LID, JK-129 and TZ-3 BOARD

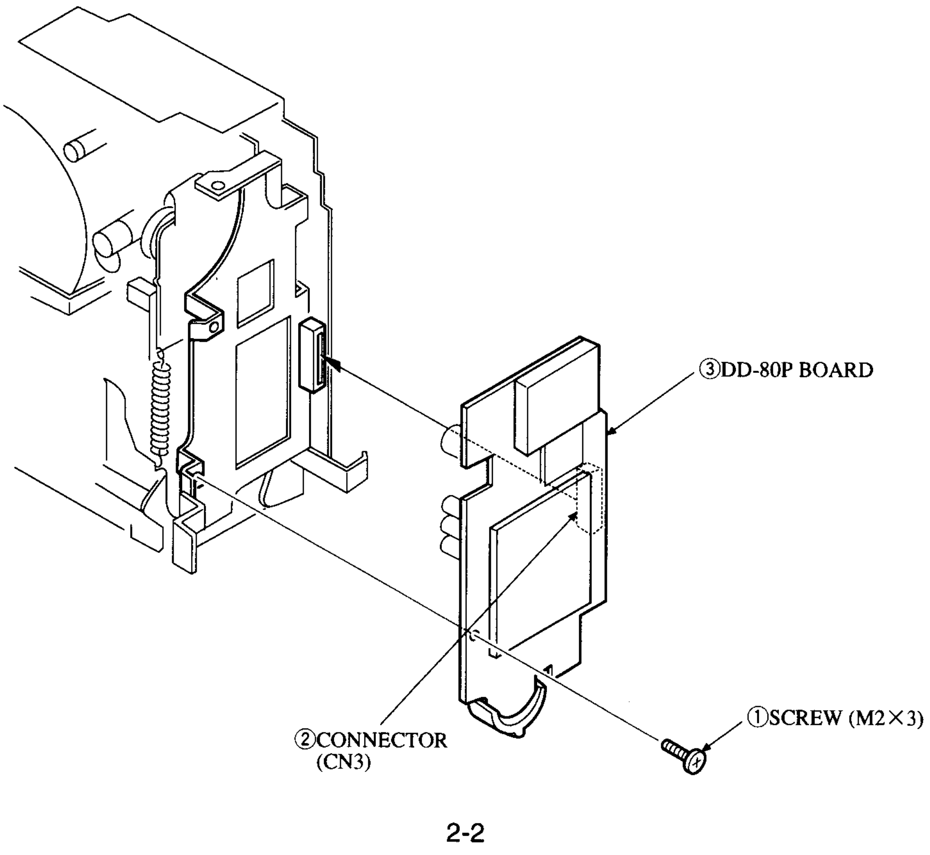


① (To remove the lids and board without having caught by claws, the unit must be put in the EJECT mode. (See SERVICE NOTE on page 5.))

(Insert a screwdriver into clearance to open then incline the screwdriver in the direction of arrow until the claws are unlocked from the LS LID.)

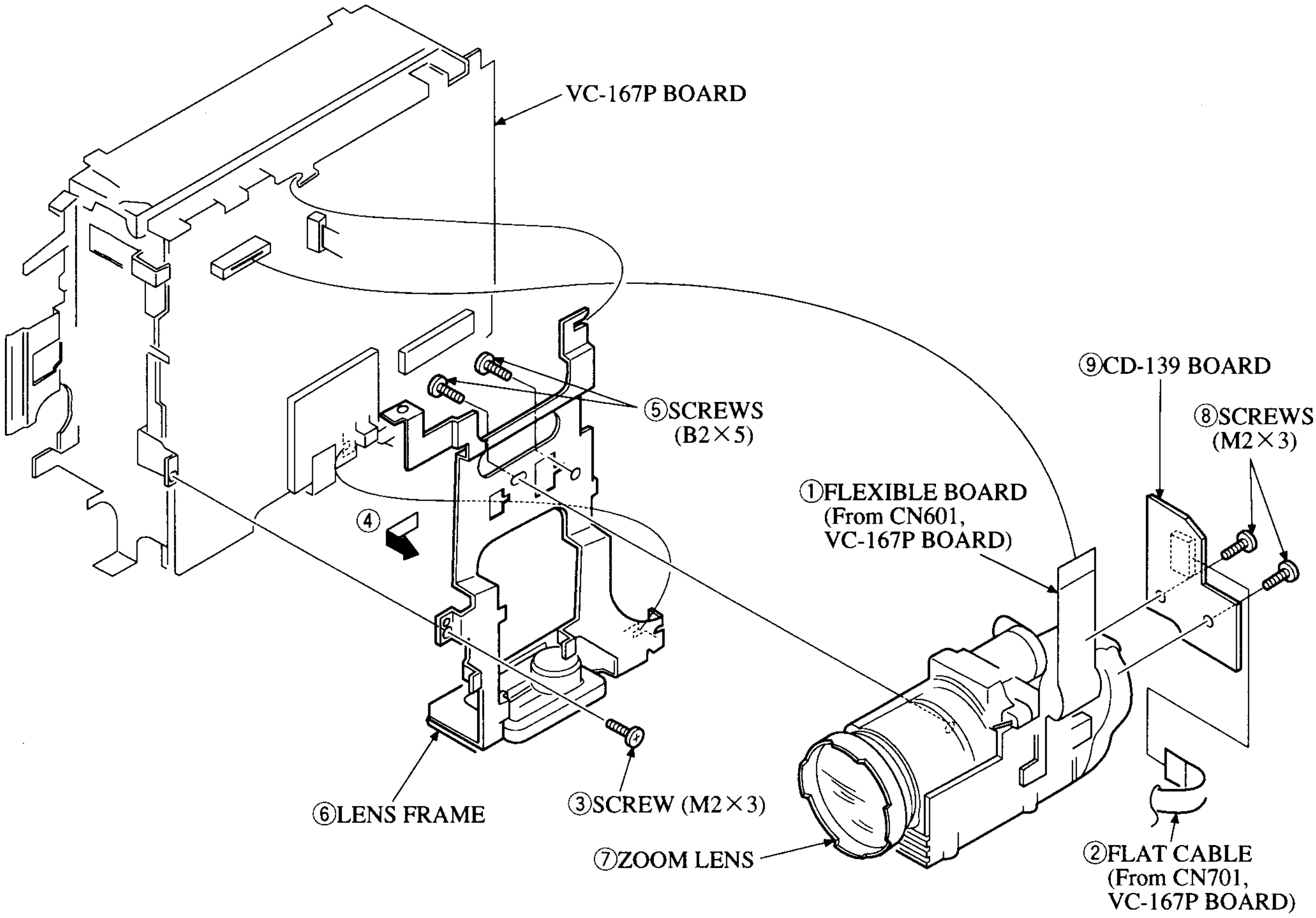
Screwdriver
LS LID
CASSETTE COMPARTMENT BLOCK
claws
⑤LS LID
claws
CASSETTE COMPARTMENT BLOCK
③Unlock the claws B.
Claw B
Claw B
④Remove the CASSETTE LID ASSY in the direction of arrow.
Claw A
Claw A
②Unlock the claws A.
⑥FLAT CABLE (From CN60)
⑨FLAT CABLE (From CN650)
⑩SCREWS (M2×3)
⑪TZ-3 BOARD
⑦SCREWS (M2×4)
⑧JK-129 BOARD

2-4. REMOVAL OF DD-80P BOARD

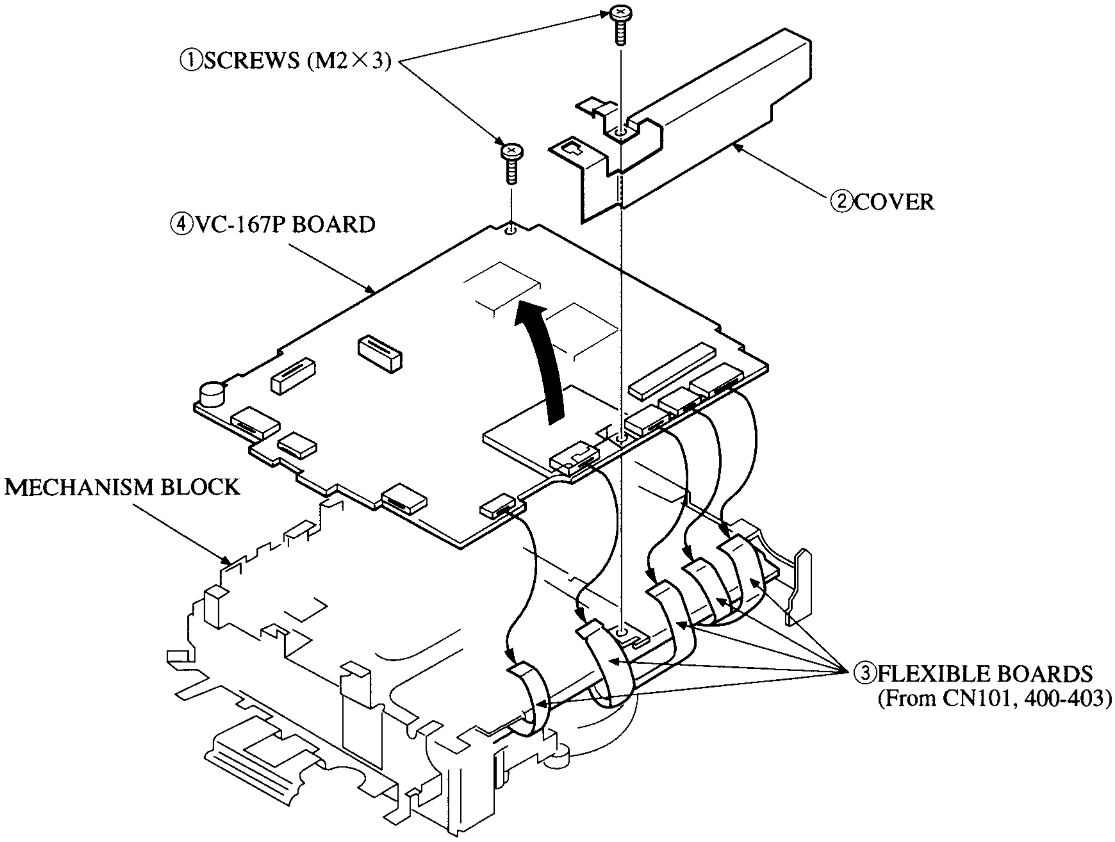


③DD-80P BOARD
②CONNECTOR (CN3)
①SCREW (M2×3)

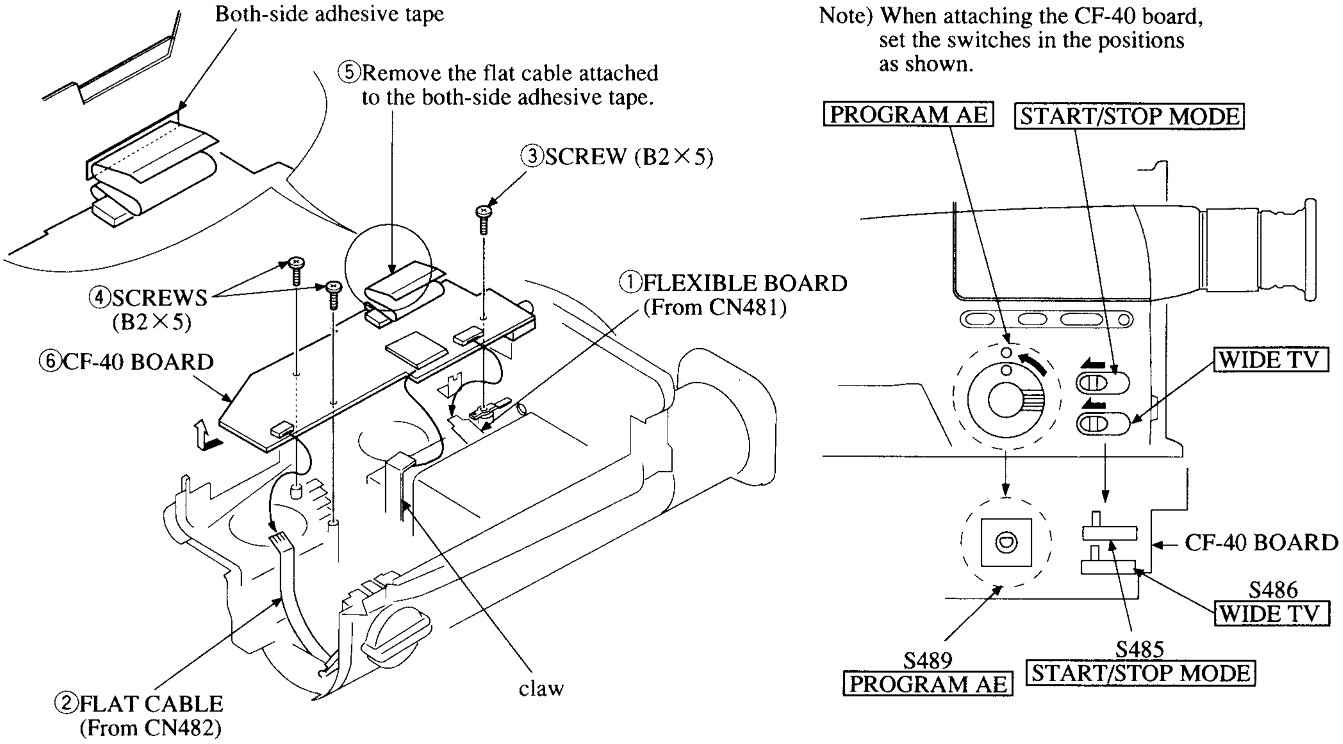
2-5. REMOVAL OF ZOOM LENS and CD-139 BOARD


VC-167P BOARD
⑨CD-139 BOARD
⑤SCREWS
(B2×5)
⑧SCREWS
(M2×3)
①FLEXIBLE BOARD
(From CN601,
VC-167P BOARD)
④
⑥LENS FRAME
③SCREW (M2×3)
⑦ZOOM LENS
②FLAT CABLE
(From CN701,
VC-167P BOARD)

2-6. REMOVAL OF VC-167P BOARD

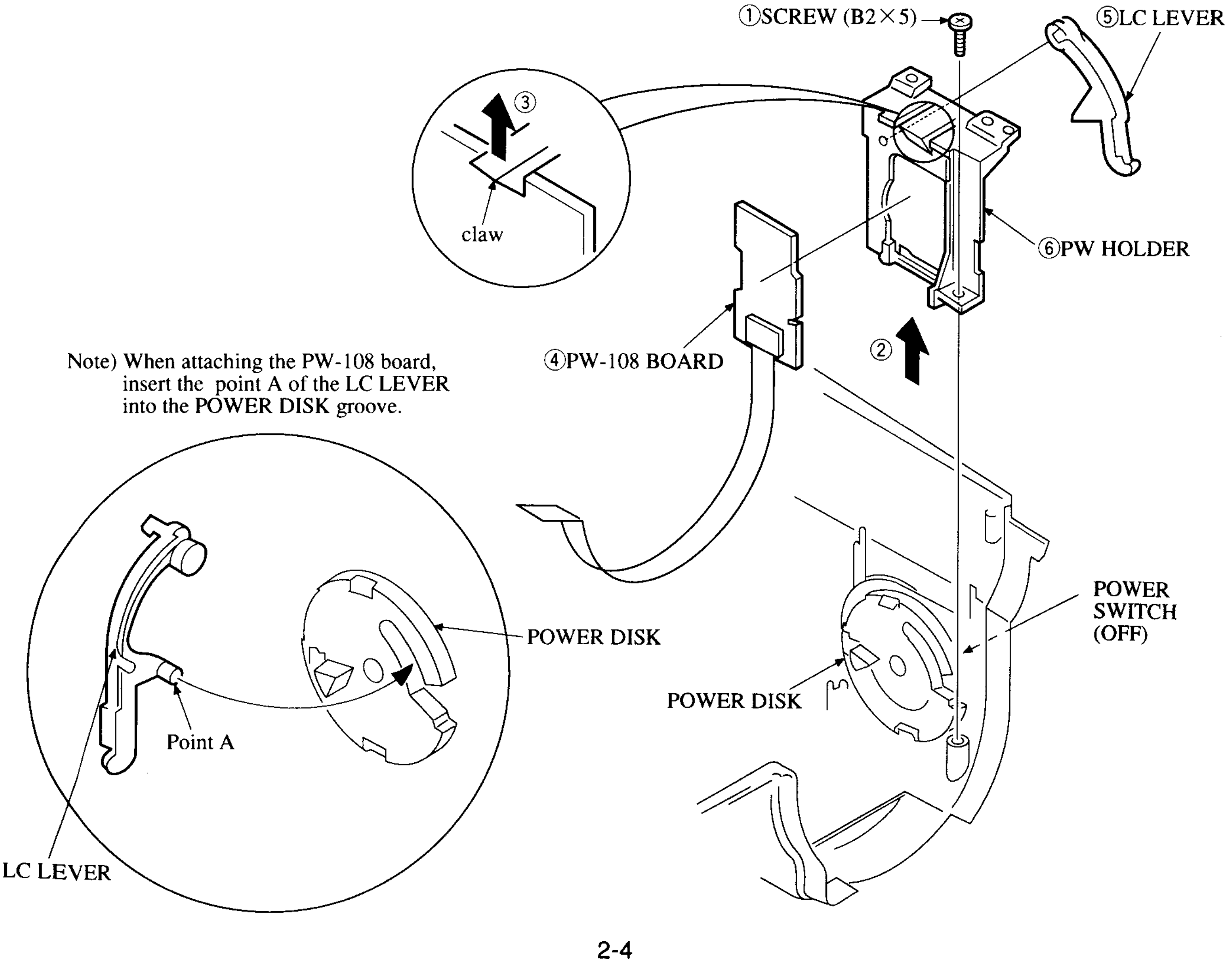

①SCREWS (M2×3)
②COVER
④VC-167P BOARD
MECHANISM BLOCK
③FLEXIBLE BOARDS
(From CN101, 400-403)

2-7. REMOVAL OF CF-40 BOARD


Both-side adhesive tape
⑤Remove the flat cable attached to the both-side adhesive tape.
③SCREW (B2×5)
④SCREWS (B2×5)
⑥CF-40 BOARD
①FLEXIBLE BOARD (From CN481)
②FLAT CABLE (From CN482)
claw
PROGRAM AE
START/STOP MODE
WIDE TV
CF-40 BOARD
S486
WIDE TV
S489
PROGRAM AE
S485
START/STOP MODE

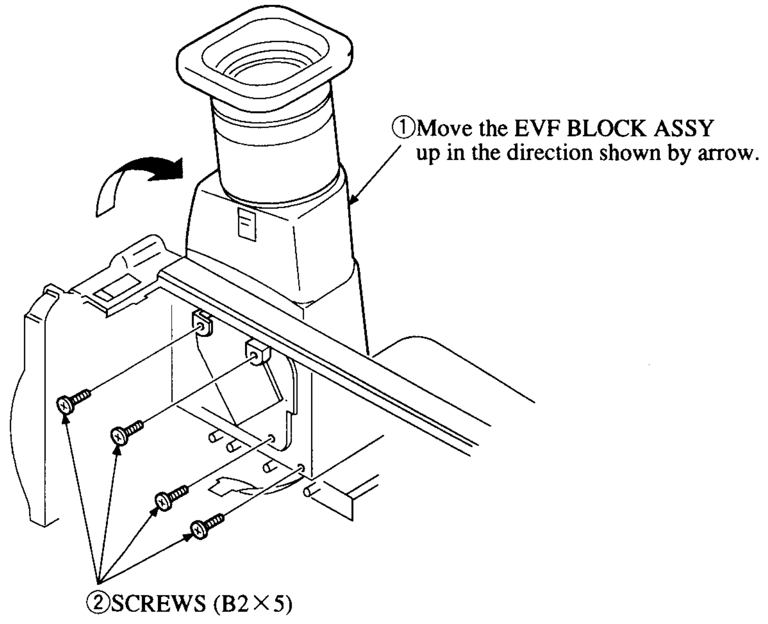
Note) When attaching the CF-40 board, set the switches in the positions as shown.

2-8. REMOVAL OF PW-108 BOARD


①SCREW (B2×5)
⑤LC LEVER
③
claw
⑥PW HOLDER
④PW-108 BOARD
②
POWER SWITCH (OFF)
POWER DISK
POWER DISK
Point A
LC LEVER

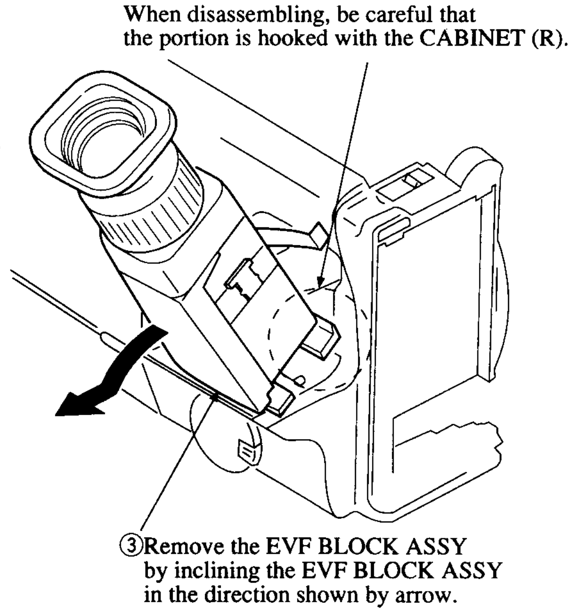
Note) When attaching the PW-108 board, insert the point A of the LC LEVER into the POWER DISK groove.

2-9. REMOVAL OF EVF BLOCK ASSY



①Move the EVF BLOCK ASSY up in the direction shown by arrow.

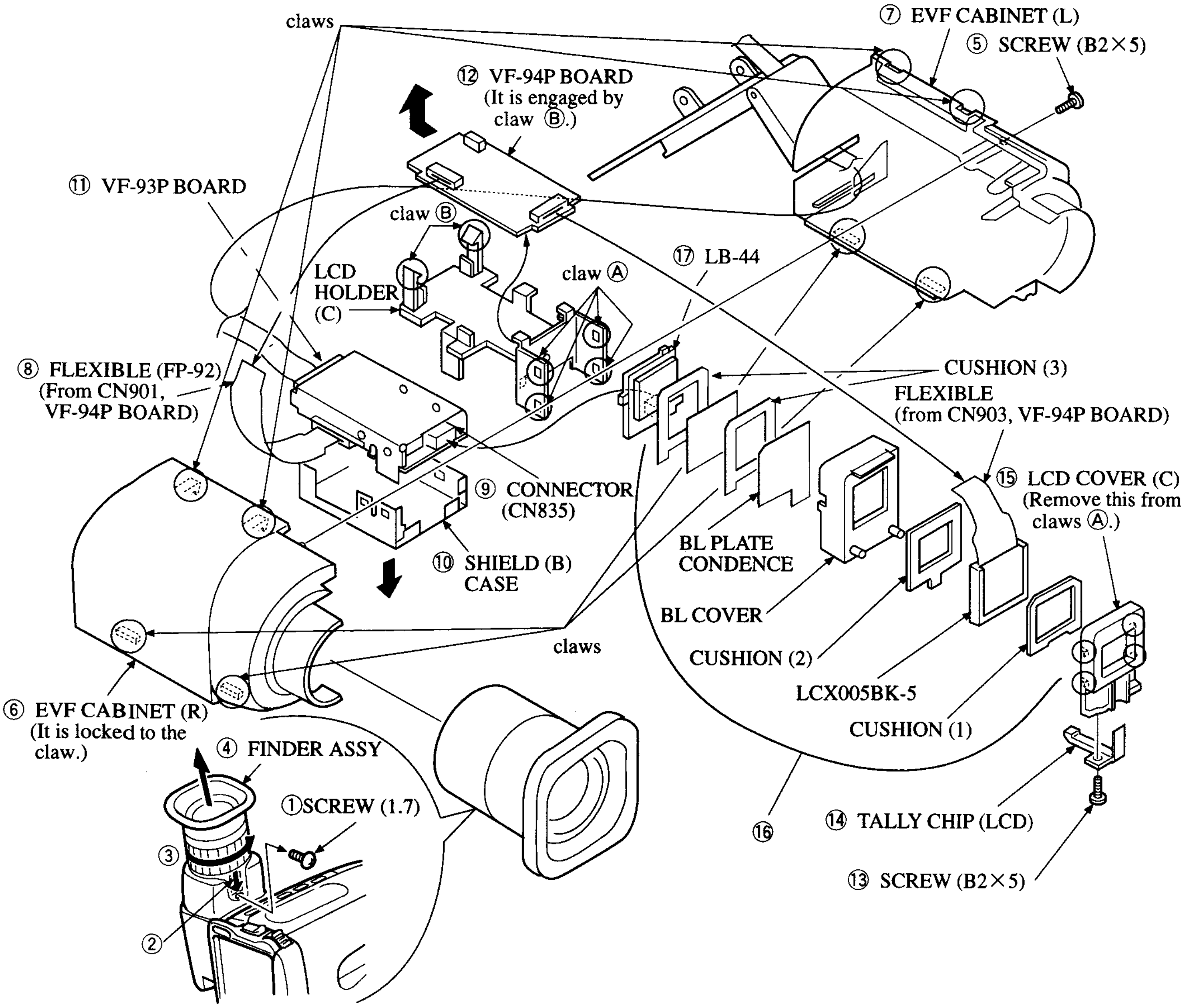
②SCREWS (B2×5)



When disassembling, be careful that the portion is hooked with the CABINET (R).

③Remove the EVF BLOCK ASSY by inclining the EVF BLOCK ASSY in the direction shown by arrow.

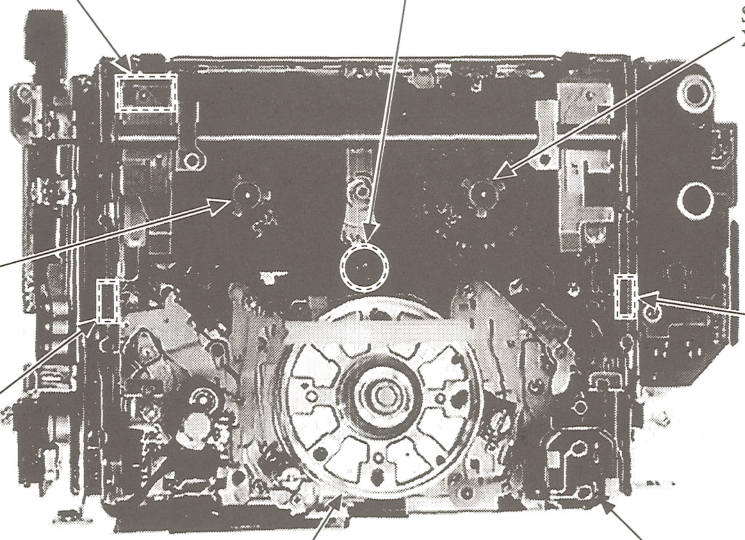
2-10. REMOVAL OF VF-93P, VF-94P and LB-44 BOARD



claws
⑦ EVF CABINET (L)
⑤ SCREW (B2×5)
⑫ VF-94P BOARD
(It is engaged by claw Ⓑ.)
⑪ VF-93P BOARD
claw Ⓑ
LCD HOLDER (C)
claw Ⓐ
⑰ LB-44
⑧ FLEXIBLE (FP-92)
(From CN901, VF-94P BOARD)
CUSHION (3)
FLEXIBLE
(from CN903, VF-94P BOARD)
⑨ CONNECTOR
(CN835)
⑮ LCD COVER (C)
(Remove this from claws Ⓐ.)
⑩ SHIELD (B) CASE
BL PLATE CONDENCE
BL COVER
claws
CUSHION (2)
LCX005BK-5
⑥ EVF CABINET (R)
(It is locked to the claw.)
CUSHION (1)
④ FINDER ASSY
①SCREW (1.7)
③
②
⑯
⑭ TALLY CHIP (LCD)
⑬ SCREW (B2×5)

2-11. INTERNAL VIEWS

—LEFT SIDE—



S001
REC PROOF SWITCH
1-692-614-11

D001
DIODE GL453S
8-719-988-42

S REEL DECK ASSY
X-3945-397-1

T REEL DECK ASSY
X-3945-398-1

Q002
PHOTO TRANSISTOR PT4850F
8-729-907-25

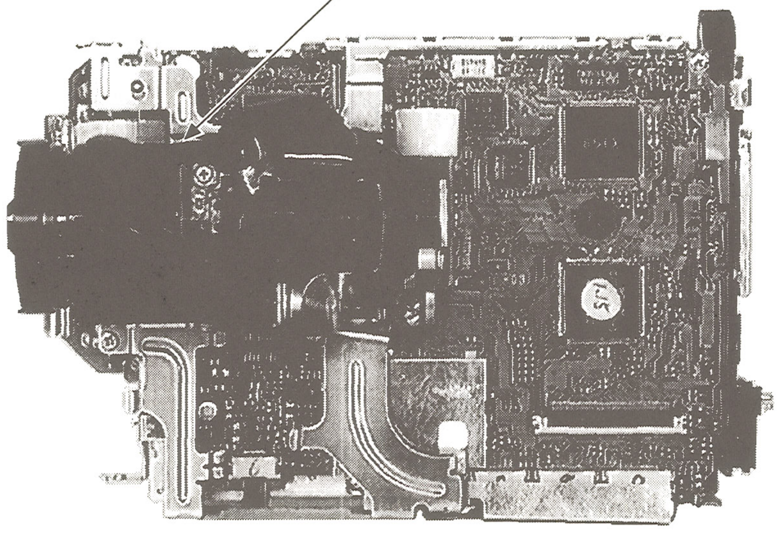
Q001
PHOTO TRANSISTOR
PT4850F
8-729-907-25

M903
LOADING MOTOR
X-3945-401-1

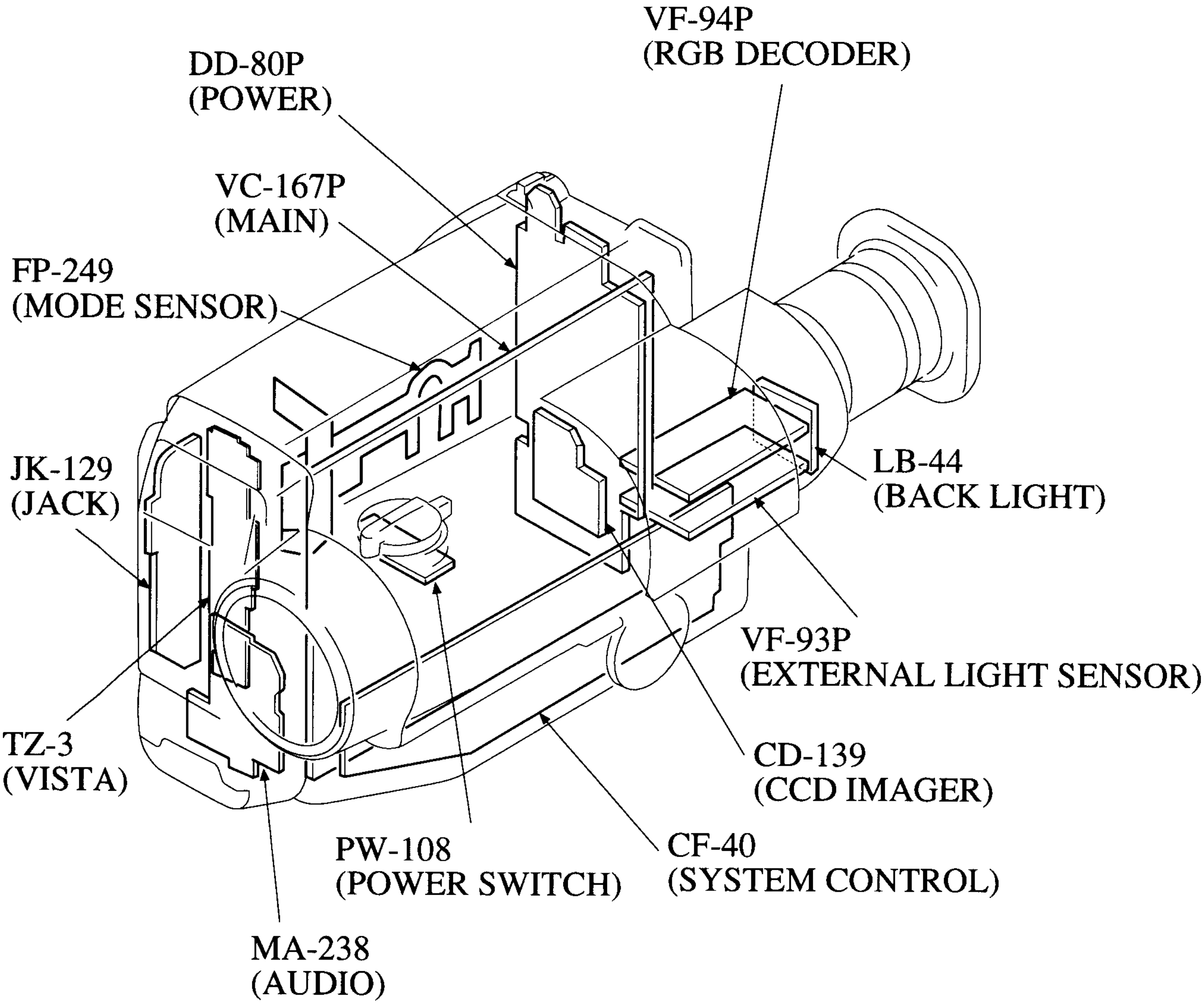
M901
DRUM BLOCK ASSY (DGH-OC2A-R)
A-7048-806-A

—RIGHT SIDE—

ZOOM LENS (VCL-5412WB)
1-547-739-21

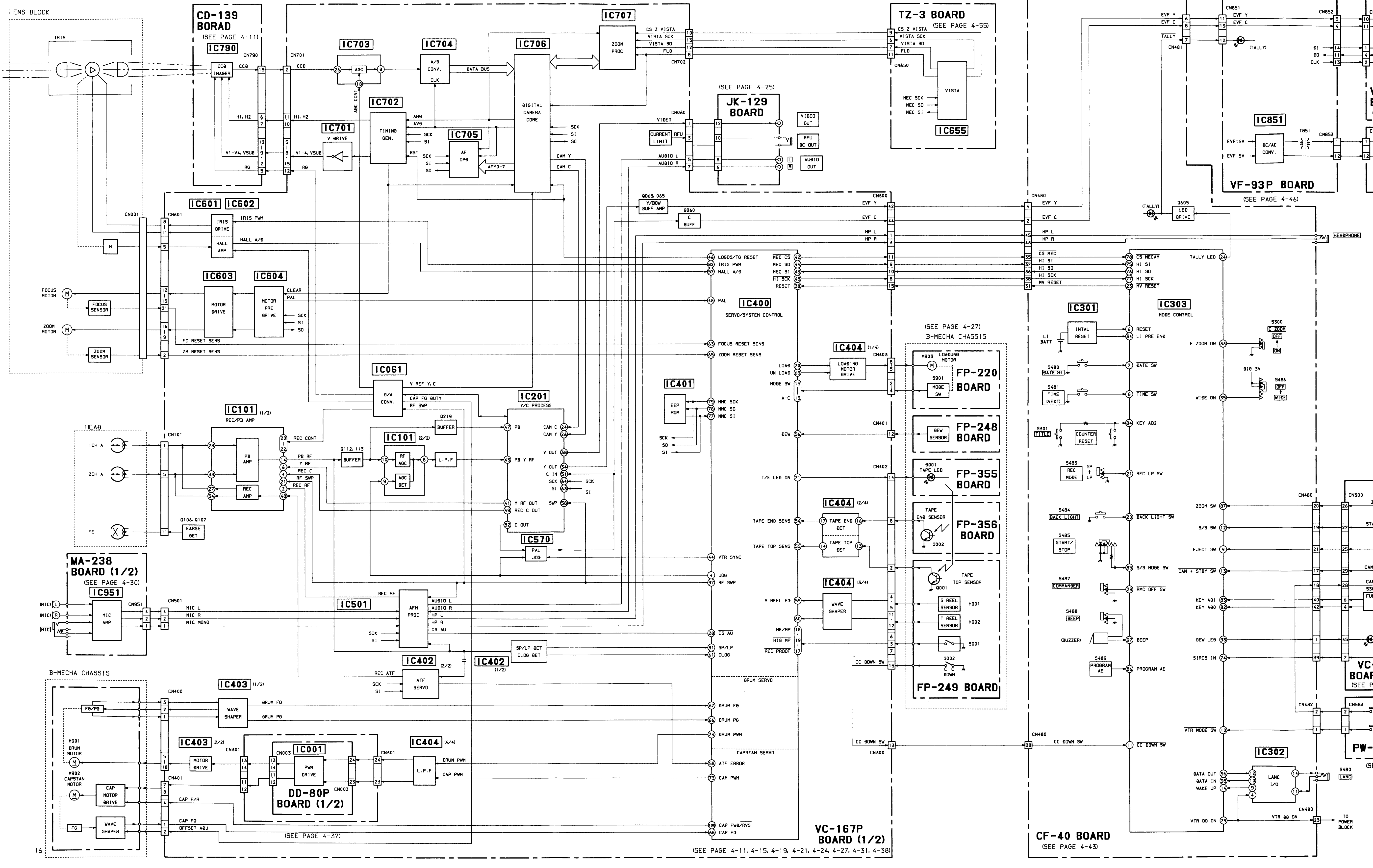


2-12. CIRCUIT BOARDS LOCATION

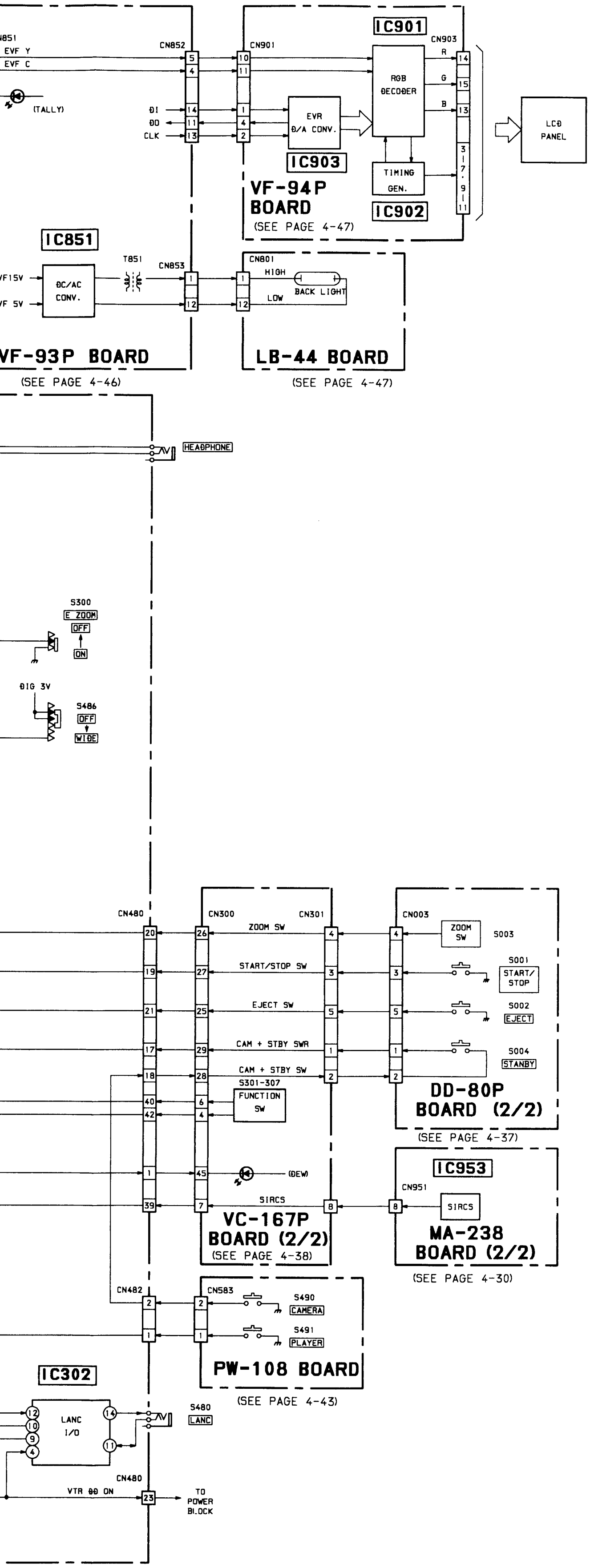

VF-94P
(RGB DECODER)
DD-80P
(POWER)
VC-167P
(MAIN)
FP-249
(MODE SENSOR)
JK-129
(JACK)
LB-44
(BACK LIGHT)
VF-93P
(EXTERNAL LIGHT SENSOR)
TZ-3
(VISTA)
CD-139
(CCD IMAGER)
PW-108
(POWER SWITCH)
CF-40
(SYSTEM CONTROL)
MA-238
(AUDIO)

SECTION 3
BLOCK DIAGRAMS

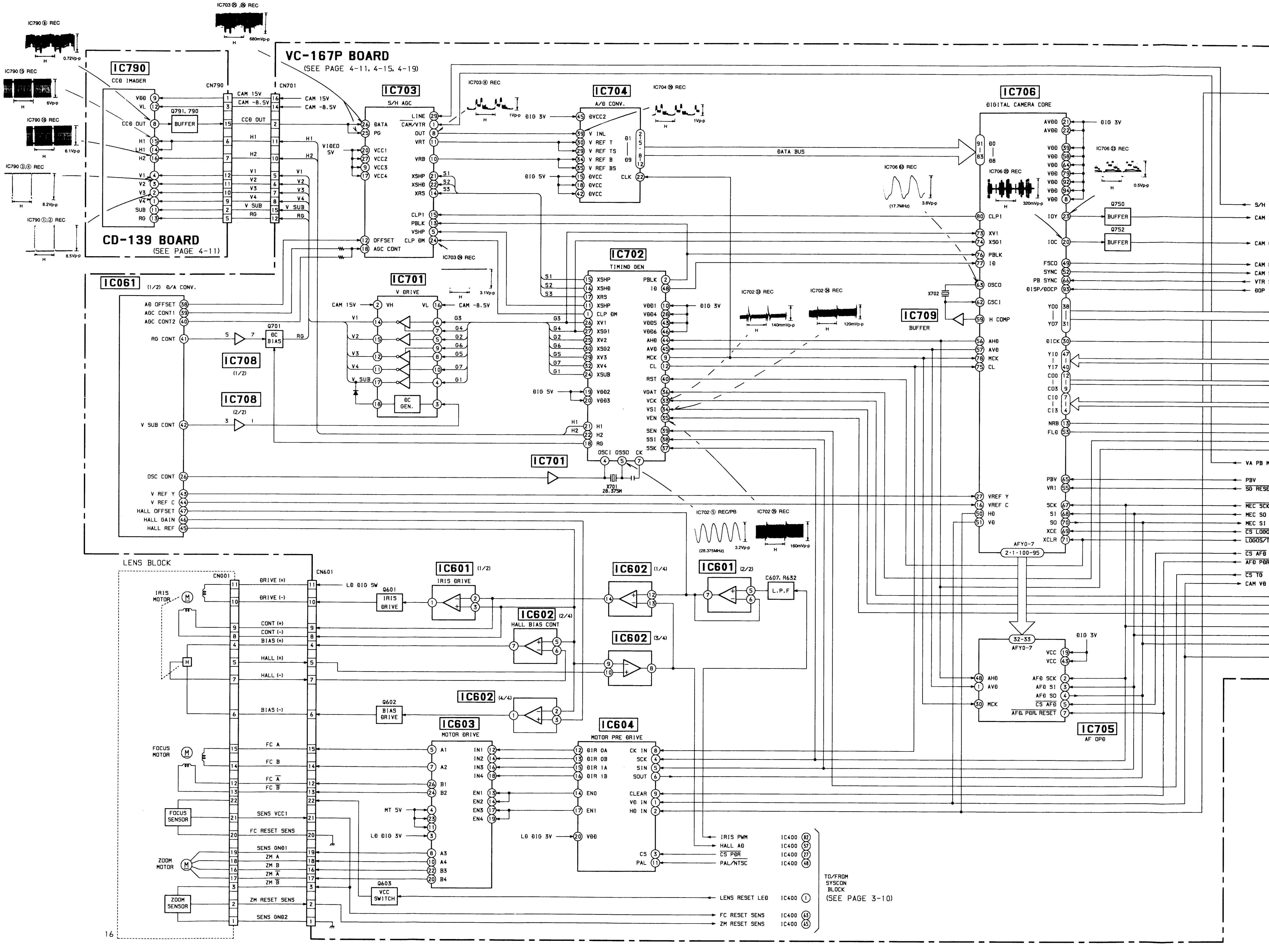
3-1. OVERALL BLOCK DIAGRAM

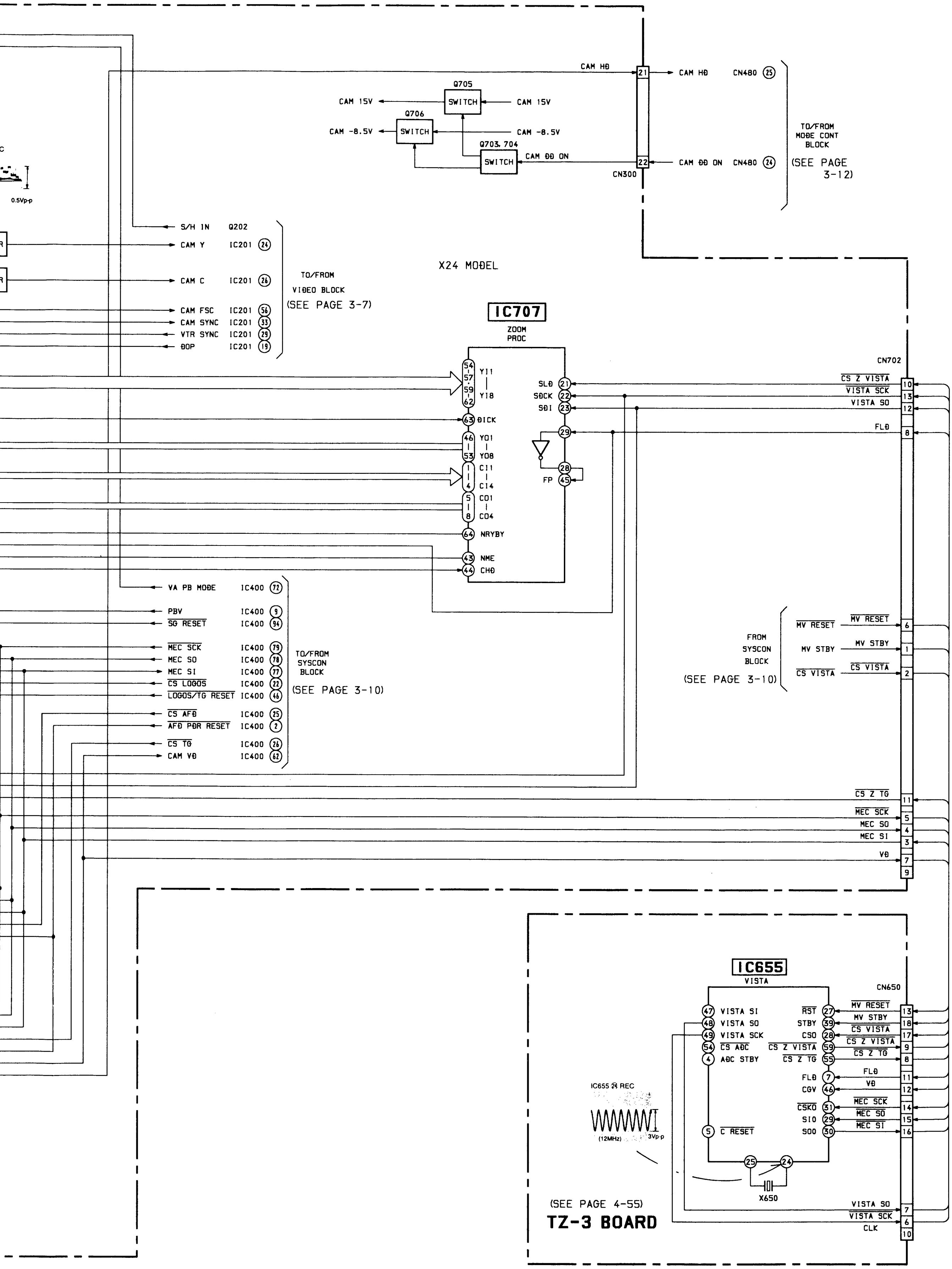


LENS BLOCK
IRIS
FOCUS MOTOR
FOCUS SENSOR
ZOOM MOTOR
ZOOM SENSOR
CD-139 BORAD
(SEE PAGE 4-11)
IC790
CCD IMAGER
CN790
CN701
IC703
AGC
IC704
A/D CONV.
CLK
DATA BUS
IC706
DIGITAL CAMERA CORE
IC707
ZOOM PROC
CS Z VISTA
VISTA SCK
VISTA SO
FLD
CN702
IC702
TIMING GEN.
IC701
V DRIVE
IC705
AF DPD
AFYD-7
TZ-3 BOARD
(SEE PAGE 4-55)
CN650
VISTA
MEC SCK
MEC SO
MEC SI
IC655
(SEE PAGE 4-25)
JK-129 BOARD
CN060
VIDEO
CURRENT LIMIT
RFU
AUDIO L
AUDIO R
VIDEO OUT
RFU DC OUT
AUDIO OUT
CN001
CN601
IC601
IC602
IRIS DRIVE
IRIS PWM
HALL AMP
HALL A/D
IC603
MOTOR DRIVE
IC604
MOTOR PRE DRIVE
CLEAR
PAL
FC RESET SENS
ZM RESET SENS
Q063, 065
Y/DDW BUFF AMP
Q060
C BUFF
CN300
EVF Y
EVF C
HP L
HP R
IC400
SERVO/SYSTEM CONTROL
LOGOS/TO RESET
IRIS PWM
HALL A/D
FOCUS RESET SENS
ZOOM RESET SENS
IC061
D/A CONV.
V REF Y, C
CAP FG DUTY
RF SWP
IC201
Y/C PROCESS
HEAD
1CH A
2CH A
FE
CN101
IC101 (1/2)
REC/PB AMP
PB AMP
REC AMP
REC CONT
PB RF
Y RF
REC C
RF SWP
REC RF
Q112, 113
BUFFER
IC101 (2/2)
RF ADC
AGC DET
L.P.F
Q219
BUFFER
Q104, Q107
EARSE DET
IC570
PAL JOG
VTR SYNC
JOG
RF SWP
MA-238 BOARD (1/2)
(SEE PAGE 4-30)
IC951
MIC AMP
CN951
CN501
MIC L
MIC R
MIC MONO
IC501
AFM PROC
AUDIO L
AUDIO R
HP L
HP R
CS AU
REC RF
SP/LP DET
CLOG DET
IC402 (2/2)
IC402 (1/2)
ATF SERVO
REC ATF
B-MECHA CHASSIS
CN400
FG/PG
M901 DRUM MOTOR
M902 CAPSTAN MOTOR
CAP MOTOR DRIVE
FG
WAVE SHAPER
IC403 (1/2)
DRUM FG
DRUM PG
IC403 (2/2)
MOTOR DRIVE
CN301
CN401
IC001
PWM DRIVE
DD-80P BOARD (1/2)
CN003
IC404 (4/4)
L.P.F
DRUM PWM
CAP PWM
CAP F/R
CAP FG
OFFSET ADJ
(SEE PAGE 4-37)
DRUM SERVO
CAPSTAN SERVO
ATF ERROR
CAM PWM
CAP FWD/RVS
IC401
EEP ROM
MMC SCK
MMC SO
MMC SI
IC404 (1/4)
LOADING MOTOR DRIVE
LOAD
UN LOAD
MODE SW
DEW
T/E LED ON
IC404 (2/4)
TAPE END DET
TAPE TOP DET
TAPE END SENS
TAPE TOP SENS
IC404 (3/4)
WAVE SHAPER
S REEL FG
ME/MP
HI8 MP
REC PROOF
CC DOWN SW
(SEE PAGE 4-27)
B-MECHA CHASSIS
M903 LOADING MOTOR
S901 MODE SW
FP-220 BOARD
DEW SENSOR
FP-248 BOARD
D001 TAPE LED
FP-355 BOARD
TAPE END SENSOR
Q002
FP-356 BOARD
TAPE TOP SENSOR
Q001
S REEL SENSOR
H001
T REEL SENSOR
H002
S001
S002 CC DOWN
FP-249 BOARD
VC-167P BOARD (1/2)
(SEE PAGE 4-11, 4-15, 4-19, 4-21, 4-24, 4-27, 4-31, 4-38)
CN480
CN481
EVF Y
EVF C
TALLY
Q605 LED DRIVE
HEADPHONE
CS MECAM
HI SI
HI SO
HI SCK
MV RESET
TALLY LED
IC301
INTAL RESET
LI BATT
IC303
MODE CONTROL
RESET
LI PRE END
S480 DATE (+)
DATE SW
S481 TIME (NEXT)
TIME SW
S301 TITLE
COUNTER RESET
KEY AD2
S483 REC MODE
SP LP
REC LP SW
S484 BACK LIGHT
BACK LIGHT SW
S485 START/STOP
S/S MODE SW
S487 COMMANDER
RMC OFF SW
S488 BEEP
(BUZZER)
BEEP
S489 PROGRAM AE
PROGRAM AE
S300 E ZOOM OFF ON
E ZOOM ON
S486 OFF WIDE
WIDE ON
ZOOM SW
S/S SW
EJECT SW
CAM + STBY SW
KEY AD1
KEY AD0
DEW LED
SIRCS IN
VTR MODE SW
CC DOWN SW
IC302
LANC I/O
DATA OUT
DATA IN
WAKE UP
S480 LANC
VTR DD ON
TO POWER BLOCK
CN482
CF-40 BOARD
(SEE PAGE 4-43)
CN851
CN852
CN853
(TALLY)
IC851
DC/AC CONV.
T851
EVF15V
EVF 5V
VF-93P BOARD
(SEE PAGE 4-46)
CN583

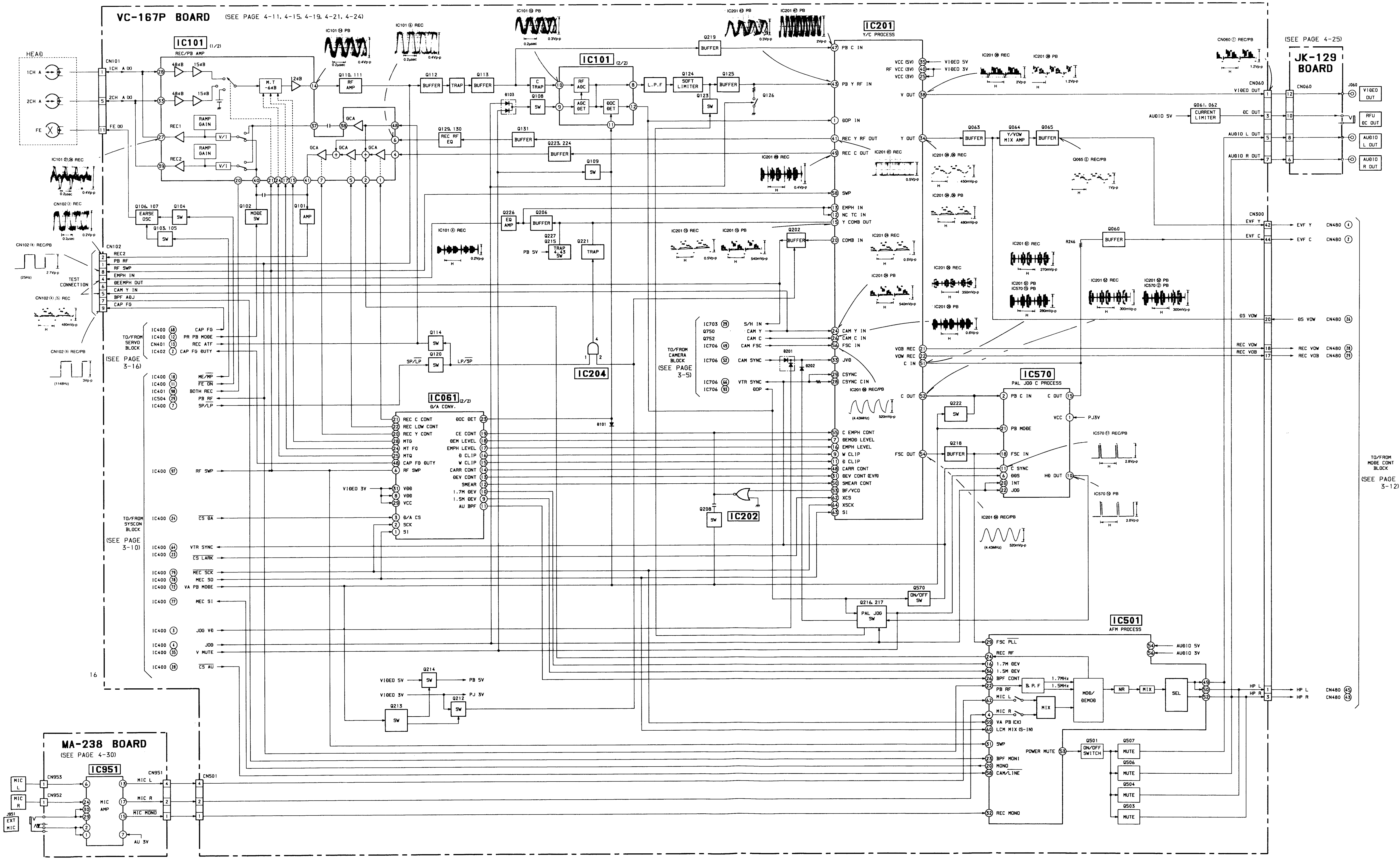

IC901
CN852
CN901
CN903
EVF Y
EVF C
(TALLY)
RGB DECODER
R
G
B
DI
DD
CLK
EVR D/A CONV.
IC903
TIMING GEN.
IC902
VF-94P BOARD
(SEE PAGE 4-47)
LCD PANEL
IC851
T851
CN853
DC/AC CONV.
VF15V
VF 5V
CN801
HIGH
LOW
BACK LIGHT
VF-93P BOARD
(SEE PAGE 4-46)
LB-44 BOARD
(SEE PAGE 4-47)
HEADPHONE
S300
E ZOOM
OFF
ON
DIG 3V
S486
OFF
WIDE
CN480
CN300
CN301
CN003
ZOOM SW
START/STOP SW
EJECT SW
CAM + STBY SWR
CAM + STBY SW
S301-307
FUNCTION SW
S003
S001 START/STOP
S002 EJECT
S004 STANBY
DD-80P BOARD (2/2)
(SEE PAGE 4-37)
(DEW)
SIRCS
IC953
CN951
VC-167P BOARD (2/2)
(SEE PAGE 4-38)
MA-238 BOARD (2/2)
(SEE PAGE 4-30)
CN482
CN583
S490 CAMERA
S491 PLAYER
PW-108 BOARD
(SEE PAGE 4-43)
IC302
LANC I/O
S480
LANC
VTR DD ON
TO POWER BLOCK

3-2. CAMERA BLOCK DIAGRAM

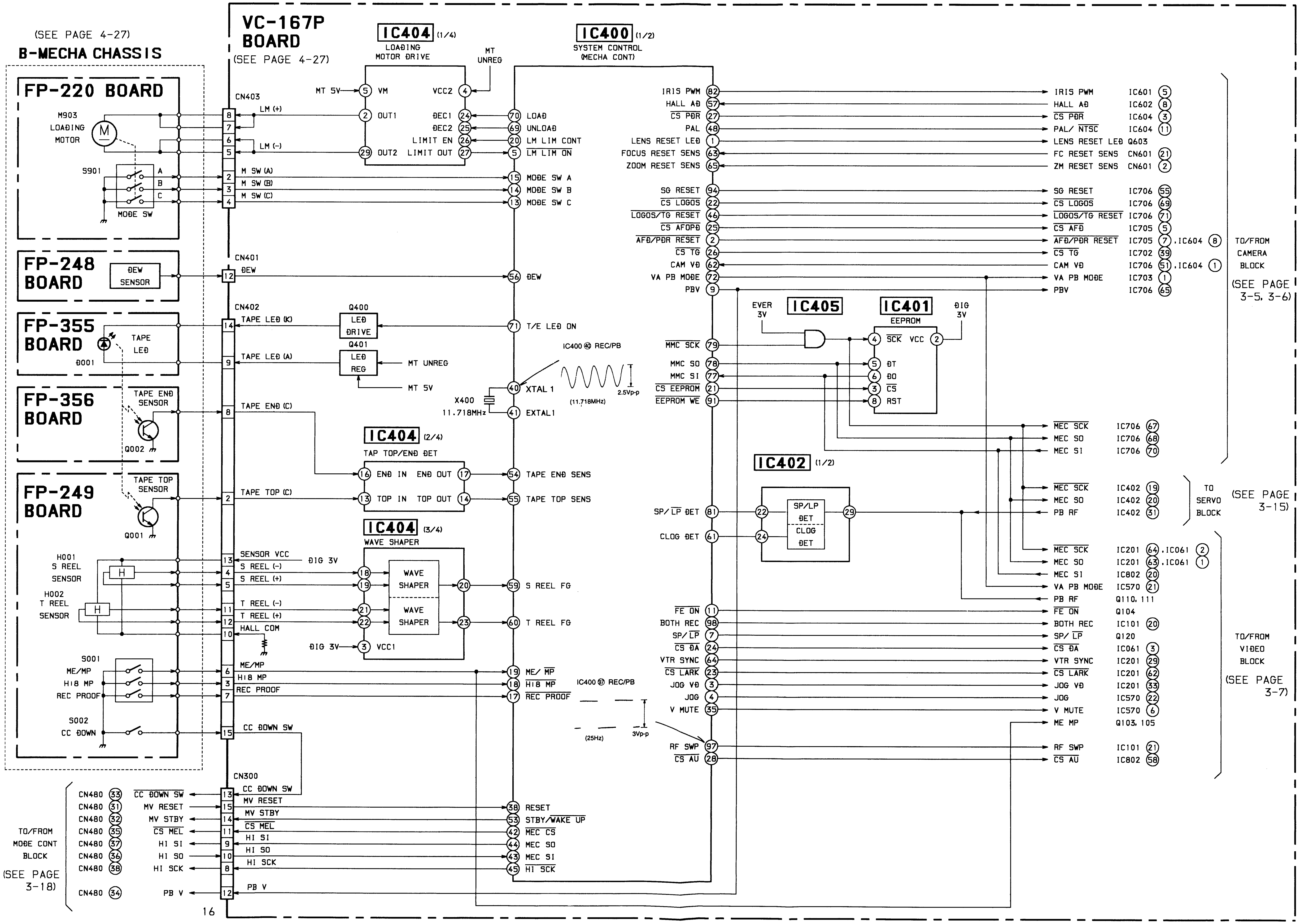

VC-167P BOARD
(SEE PAGE 4-11, 4-15, 4-19)
CD-139 BOARD
(SEE PAGE 4-11)
LENS BLOCK
IC790
CCD IMAGER
Q791, 790
BUFFER
CN790
CN701
CN601
CN001
IC703
S/H AGC
IC704
A/D CONV.
IC706
DIGITAL CAMERA CORE
IC701
V DRIVE
IC702
TIMING GEN
IC061
(1/2) D/A CONV.
IC708 (1/2)
IC708 (2/2)
Q701
DC BIAS
IC709
BUFFER
Q750
BUFFER
Q752
BUFFER
X701
28.375M
X702
DATA BUS
IC601 (1/2)
IRIS DRIVE
IC601 (2/2)
IC602 (1/4)
IC602 (2/4)
HALL BIAS CONT
IC602 (3/4)
IC602 (4/4)
C607, R632
L.P.F
Q601
IRIS DRIVE
Q602
BIAS DRIVE
Q603
VCC SWITCH
IC603
MOTOR DRIVE
IC604
MOTOR PRE DRIVE
IC705
AF OPD
AFYD-7
IRIS MOTOR
FOCUS MOTOR
FOCUS SENSOR
ZOOM MOTOR
ZOOM SENSOR
IRIS PWM
HALL AD
CS PDR
PAL/NTSC
LENS RESET LED
FC RESET SENS
ZM RESET SENS
TO/FROM SYSCON BLOCK
(SEE PAGE 3-10)
16


CAM HD
CAM HD
CN480 ㉕
Q705
SWITCH
CAM 15V
CAM 15V
Q706
SWITCH
CAM -8.5V
CAM -8.5V
Q703, 704
SWITCH
CAM DD ON
CAM DD ON
CN480 ㉔
CN300
TO/FROM
MODE CONT
BLOCK
(SEE PAGE 3-12)
0.5Vp-p
S/H IN Q202
CAM Y IC201 ㉔
CAM C IC201 ㉖
CAM FSC IC201 (56)
CAM SYNC IC201 ㉝
VTR SYNC IC201 ㉙
DOP IC201 ⑲
TO/FROM
VIDEO BLOCK
(SEE PAGE 3-7)
X24 MODEL
IC707
ZOOM
PROC
YI1 | YI8
DICK
YO1 | YO8
CI1 | CI4
CO1 | CO4
NRYBY
NME
CHD
SLD ㉑
SDCK ㉒
SDI ㉓
FP
CN702
CS Z VISTA
VISTA SCK
VISTA SO
FLD
VA PB MODE IC400 (72)
PBV IC400 ⑨
SG RESET IC400 (94)
MEC SCK IC400 (79)
MEC SO IC400 (78)
MEC SI IC400 (77)
CS LOGOS IC400 ㉒
LOGOS/TG RESET IC400 ㊻
CS AFD IC400 ㉕
AFD PDR RESET IC400 ②
CS TG IC400 ㉖
CAM VD IC400 (62)
TO/FROM
SYSCON
BLOCK
(SEE PAGE 3-10)
FROM
SYSCON
BLOCK
(SEE PAGE 3-10)
MV RESET
MV STBY
CS VISTA
CS Z TG
MEC SCK
MEC SO
MEC SI
VD
IC655
VISTA
CN650
VISTA SI
VISTA SO
VISTA SCK
CS ADC
ADC STBY
C RESET
RST
STBY
CSO
CS Z VISTA
CS Z TG
FLD
CGV
CSKO
SIO
SOO
MV RESET
MV STBY
CS VISTA
CS Z VISTA
CS Z TG
FLD
VD
MEC SCK
MEC SO
MEC SI
IC655 ㉔ REC
(12MHz)
3Vp-p
X650
VISTA SO
VISTA SCK
CLK
(SEE PAGE 4-55)
TZ-3 BOARD

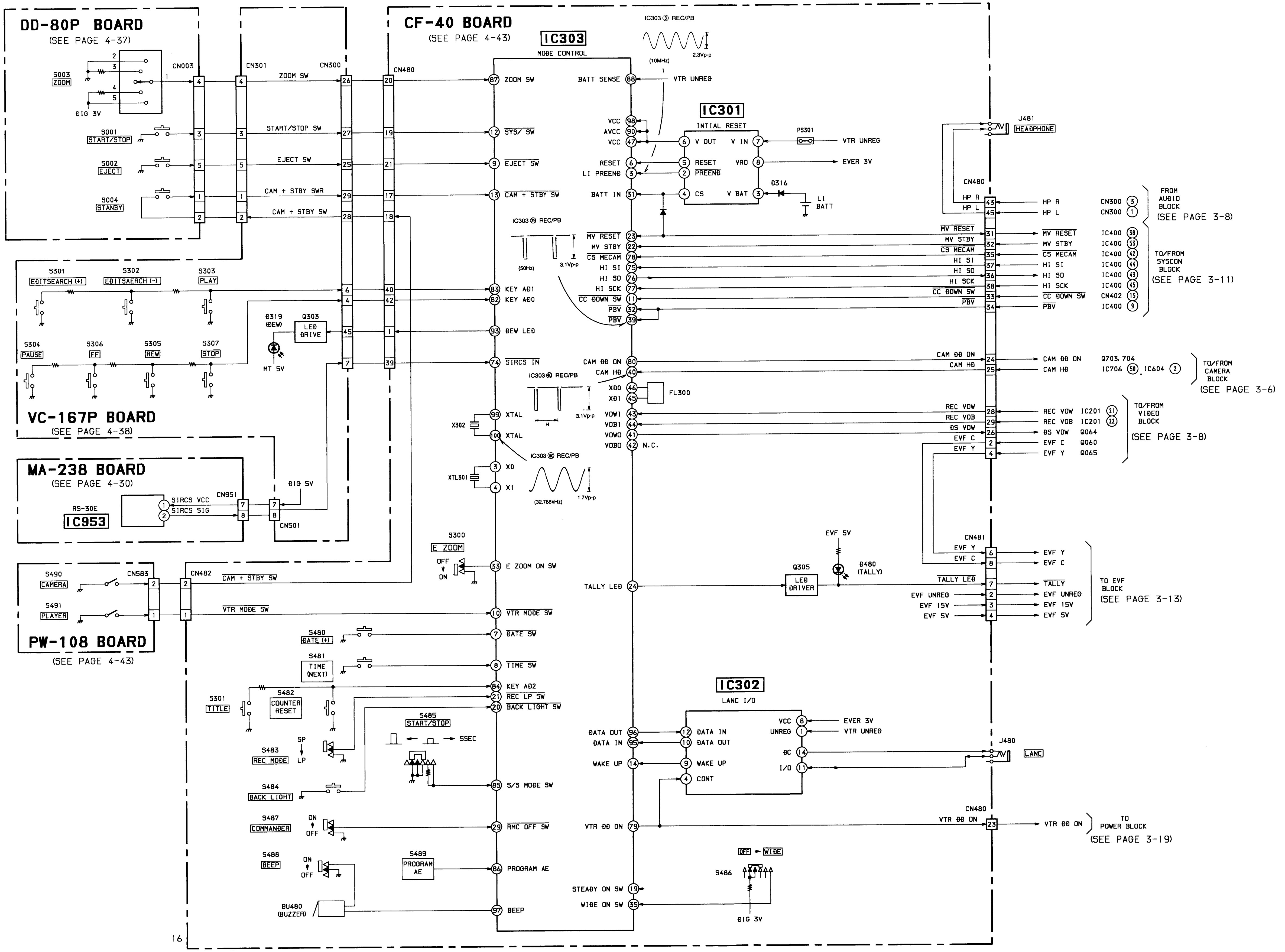
3-3. VIDEO/AUDIO BLOCK DIAGRAM


VC-167P BOARD
(SEE PAGE 4-11, 4-15, 4-19, 4-21, 4-24)
HEAD
1CH A
2CH A
FE
CN101
IC101 (1/2)
REC/PB AMP
48dB
15dB
M.T -6dB
12dB
RAMP GAIN
V/I
GCA
RF AMP
Q110, 111
Q112
BUFFER
TRAP
Q113
C TRAP
Q108
SW
IC101 (2/2)
RF AGC
AGC DET
DOC DET
L.P.F
Q124
SOFT LIMITER
Q125
Q123
Q126
Q219
IC201
Y/C PROCESS
PB C IN
PB Y RF IN
DOP IN
REC Y RF OUT
REC C OUT
SWP
EMPH IN
NC TC IN
Y COMB OUT
COMB IN
CAM Y IN
CAM C IN
FSC IN
JVD
CSYNC
CSYNC CIN
V OUT
Y OUT
C OUT
FSC OUT
VCC (5V)
RF VCC (5V)
VCC (3V)
VIDEO 5V
VIDEO 3V
Q129, 130
REC RF EQ
Q131
Q223, 224
Q109
Q106, 107
ERASE OSC
Q104
Q103, 105
Q102
MODE SW
Q101
AMP
Q226
EQ AMP
Q206
Q227
Q215
TRAP 4.43
Q221
Q202
PB 5V
CN102
REC2
PB RF
RF SWP
EMPH IN
DEEMPH OUT
CAM Y IN
BPF ADJ
CAP FG
TEST CONNECTION
TO/FROM SERVO BLOCK
(SEE PAGE 3-16)
TO/FROM SYSCON BLOCK
(SEE PAGE 3-10)
TO/FROM CAMERA BLOCK
(SEE PAGE 3-5)
TO/FROM MODE CONT BLOCK
(SEE PAGE 3-12)
Q114
Q120
SP/LP
LP/SP
IC204
IC061 (2/2)
D/A CONV.
REC C CONT
REC LOW CONT
REC Y CONT
MTG
MT FO
MTQ
CAP FG DUTY
RF SWP
DOC DET
CE CONT
DEM LEVEL
EMPH LEVEL
D CLIP
W CLIP
CARR CONT
DEV CONT
SMEAR
1.7M DEV
1.5M DEV
AU BPF
VDD
VCC
D/A CS
SCK
SI
VIDEO 3V
D101
IC202
Q208
Q063
Q064
Y/VDW MIX AMP
Q065
Q060
IC570
PAL JOG C PROCESS
PB C IN
C OUT
PB MODE
FSC IN
C SYNC
DBS
INT
JOG
HD OUT
VCC
PJ3V
Q222
Q218
Q570
ON/OFF SW
Q216, 217
PAL JOG SW
IC501
AFM PROCESS
FSC PLL
REC RF
1.7M DEV
1.5M DEV
BPF CONT
PB RF
MIC L
MIC R
VA PB (CK)
LCM MIX (S-IN)
SWP
BPF MONI
MONO
CAM/LINE
REC MONO
AUDIO 5V
AUDIO 3V
B.P.F
1.7MHz
1.5MHz
MOD/ DEMOD
NR
MIX
SEL
POWER MUTE
Q501
ON/OFF SWITCH
Q507
Q506
Q504
Q503
MUTE
HP L
HP R
Q214
Q213
Q212
VIDEO 5V
PB 5V
PJ 3V
JK-129 BOARD
(SEE PAGE 4-25)
CN060
J060
VIDEO OUT
RFU DC OUT
AUDIO L OUT
AUDIO R OUT
Q061, 062
CURRENT LIMITER
AUDIO 5V
DC OUT
VIDEO OUT
AUDIO L OUT
AUDIO R OUT
CN300
EVF Y
EVF C
DS VDW
REC VDW
REC VDB
CN480
MA-238 BOARD
(SEE PAGE 4-30)
IC951
MIC AMP
CN953
CN952
CN951
CN501
MIC L
MIC R
MIC MONO
J951
EXT MIC
AU 3V

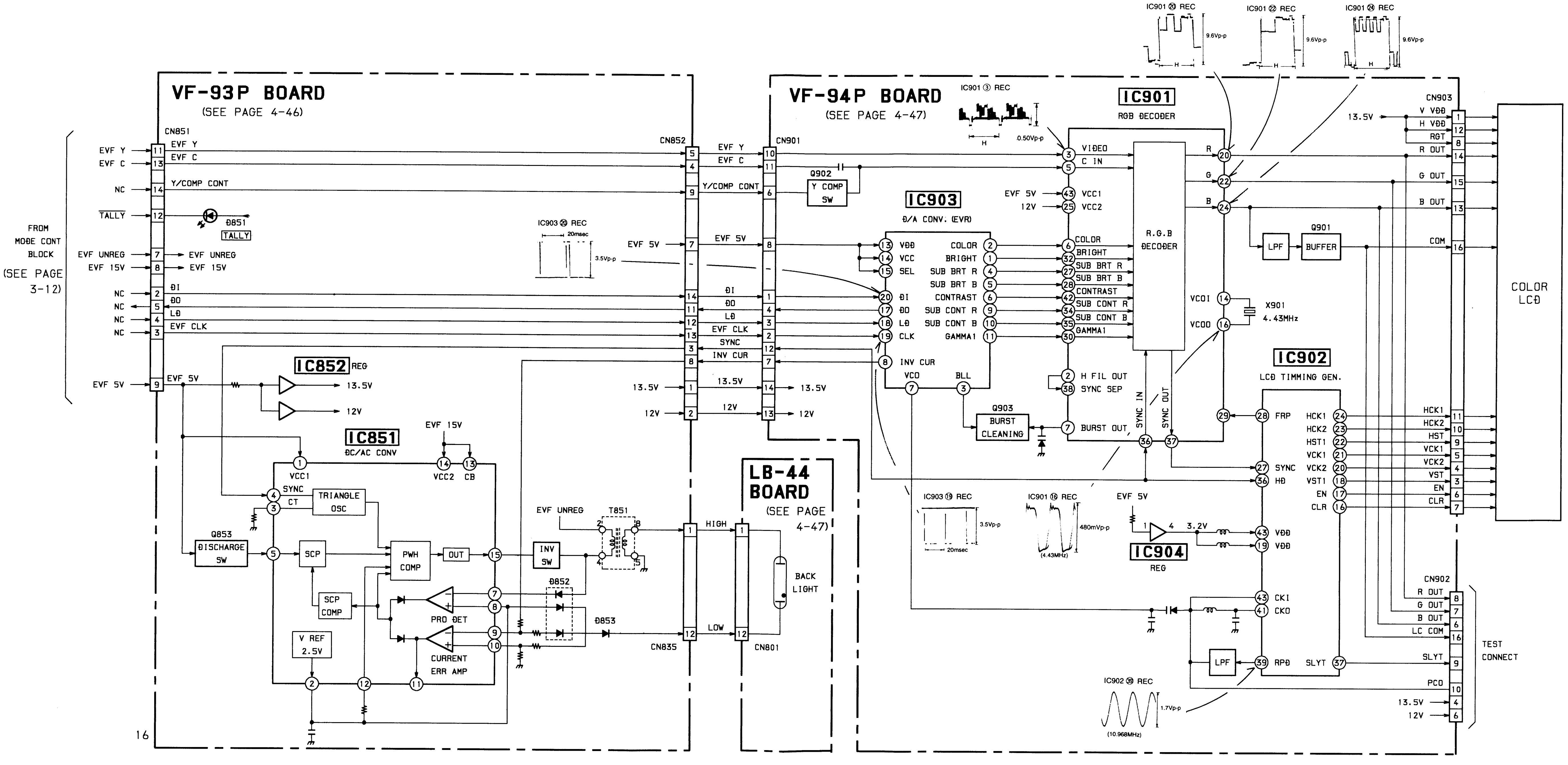
3-4. SYSTEM CONTROL BLOCK DIAGRAM


(SEE PAGE 4-27)
B-MECHA CHASSIS
FP-220 BOARD
M903 LOADING MOTOR
S901 MODE SW
A
B
C
FP-248 BOARD
DEW SENSOR
FP-355 BOARD
TAPE LED
D001
FP-356 BOARD
TAPE END SENSOR
Q002
FP-249 BOARD
TAPE TOP SENSOR
Q001
H001 S REEL SENSOR
H002 T REEL SENSOR
S001
ME/MP
HI8 MP
REC PROOF
S002 CC DOWN
VC-167P BOARD
(SEE PAGE 4-27)
CN403
LM (+)
LM (-)
M SW (A)
M SW (B)
M SW (C)
CN401
DEW
CN402
TAPE LED (K)
TAPE LED (A)
TAPE END (C)
TAPE TOP (C)
SENSOR VCC
S REEL (-)
S REEL (+)
T REEL (-)
T REEL (+)
HALL COM
ME/MP
HI8 MP
REC PROOF
CC DOWN SW
CN300
IC404 (1/4) LOADING MOTOR DRIVE
MT 5V
VM
VCC2
OUT1
OUT2
DEC1
DEC2
LIMIT EN
LIMIT OUT
MT UNREG
Q400 LED DRIVE
Q401 LED REG
MT 5V
X400 11.718MHz
IC404 (2/4) TAP TOP/END DET
END IN
END OUT
TOP IN
TOP OUT
IC404 (3/4) WAVE SHAPER
WAVE SHAPER
DIG 3V
VCC1
IC400 (1/2) SYSTEM CONTROL (MECHA CONT)
LOAD
UNLOAD
LM LIM CONT
LM LIM ON
MODE SW A
MODE SW B
MODE SW C
DEW
T/E LED ON
XTAL 1
EXTAL1
IC400 ⑳ REC/PB
2.5Vp-p
(11.718MHz)
TAPE END SENS
TAPE TOP SENS
S REEL FG
T REEL FG
ME/ MP
HI8 MP
REC PROOF
IC400 ⑲ REC/PB
(25Hz)
3Vp-p
RESET
STBY/WAKE UP
MEC CS
MEC SO
MEC SI
HI SCK
IRIS PWM
HALL AD
CS PDR
PAL
LENS RESET LED
FOCUS RESET SENS
ZOOM RESET SENS
SG RESET
CS LOGOS
LOGOS/TG RESET
CS AFDPD
AFD/PDR RESET
CS TG
CAM VD
VA PB MODE
PBV
MMC SCK
MMC SO
MMC SI
CS EEPROM
EEPROM WE
SP/ LP DET
CLOG DET
FE ON
BOTH REC
SP/ LP
CS DA
VTR SYNC
CS LARK
JOG VD
JOG
V MUTE
RF SWP
CS AU
EVER 3V
IC405
IC401 EEPROM
DIG 3V
SCK
VCC
DT
DO
CS
RST
IC402 (1/2)
SP/LP DET
CLOG DET
IRIS PWM IC601 ⑤
HALL AD IC602 ⑧
CS PDR IC604 ③
PAL/ NTSC IC604 ⑪
LENS RESET LED Q603
FC RESET SENS CN601 ㉑
ZM RESET SENS CN601 ②
SG RESET IC706 55
CS LOGOS IC706 69
LOGOS/TG RESET IC706 71
CS AFD IC705 ⑤
AFD/PDR RESET IC705 ⑦, IC604 ⑧
CS TG IC702 39
CAM VD IC706 51, IC604 ①
VA PB MODE IC703 ①
PBV IC706 65
MEC SCK IC706 67
MEC SO IC706 68
MEC SI IC706 70
TO/FROM CAMERA BLOCK
(SEE PAGE 3-5, 3-6)
MEC SCK IC402 ⑲
MEC SO IC402 ⑳
PB RF IC402 31
TO SERVO BLOCK
(SEE PAGE 3-15)
MEC SCK IC201 64, IC061 ②
MEC SO IC201 63, IC061 ①
MEC SI IC802 ⑳
VA PB MODE IC570 ㉑
PB RF Q110, 111
FE ON Q104
BOTH REC IC101 ⑳
SP/ LP Q120
CS DA IC061 ③
VTR SYNC IC201 ㉙
CS LARK IC201 62
JOG VD IC201 33
JOG IC570 ㉒
V MUTE IC570 ⑥
ME MP Q103, 105
RF SWP IC101 ㉑
CS AU IC802 58
TO/FROM VIDEO BLOCK
(SEE PAGE 3-7)
CN480 33 CC DOWN SW
CN480 31 MV RESET
CN480 32 MV STBY
CN480 35 CS MEL
CN480 37 HI SI
CN480 36 HI SO
CN480 38 HI SCK
CN480 34 PB V
TO/FROM MODE CONT BLOCK
(SEE PAGE 3-18)
16

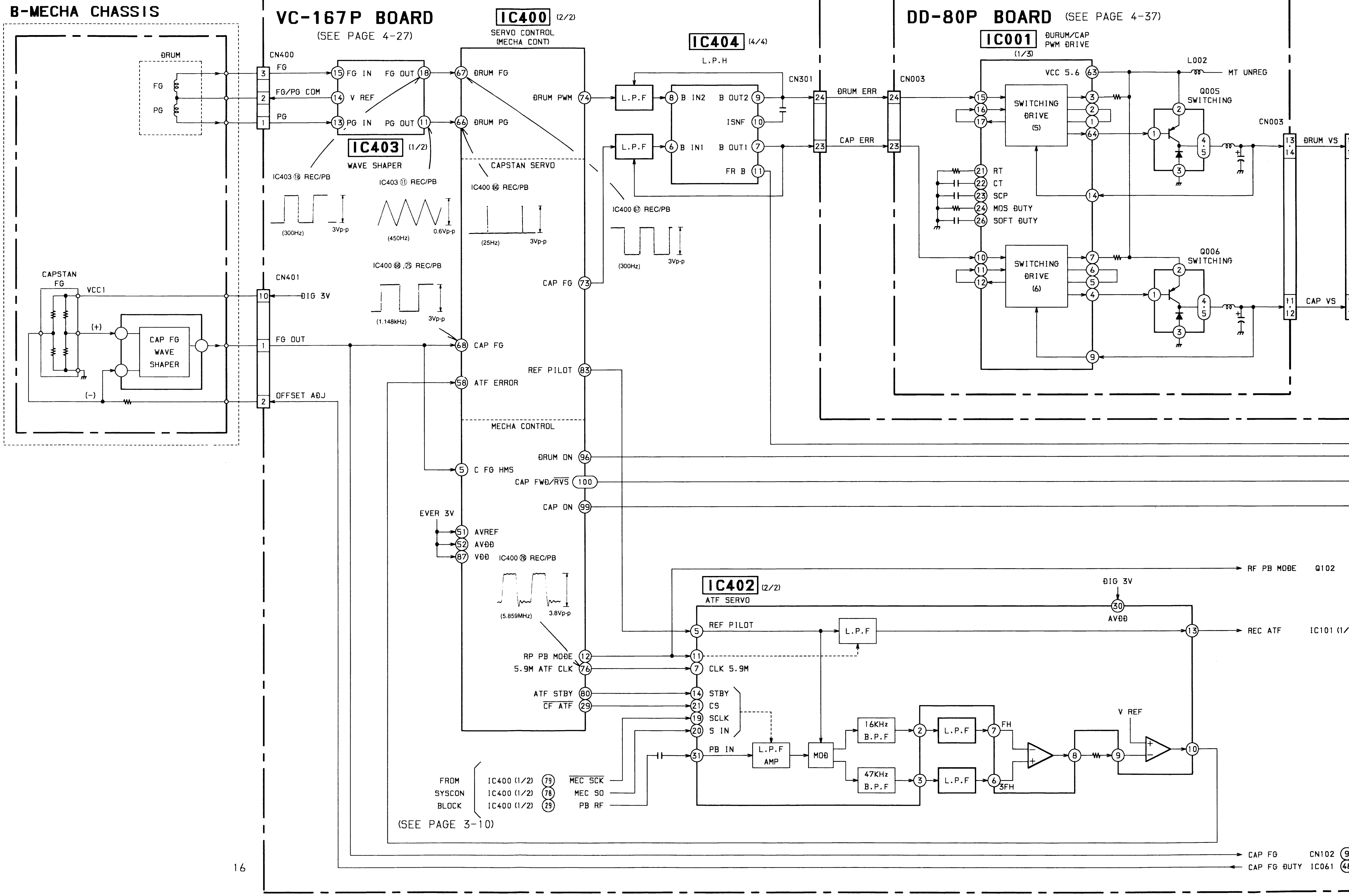
3-5. MODE CONTROL BLOCK DIAGRAM

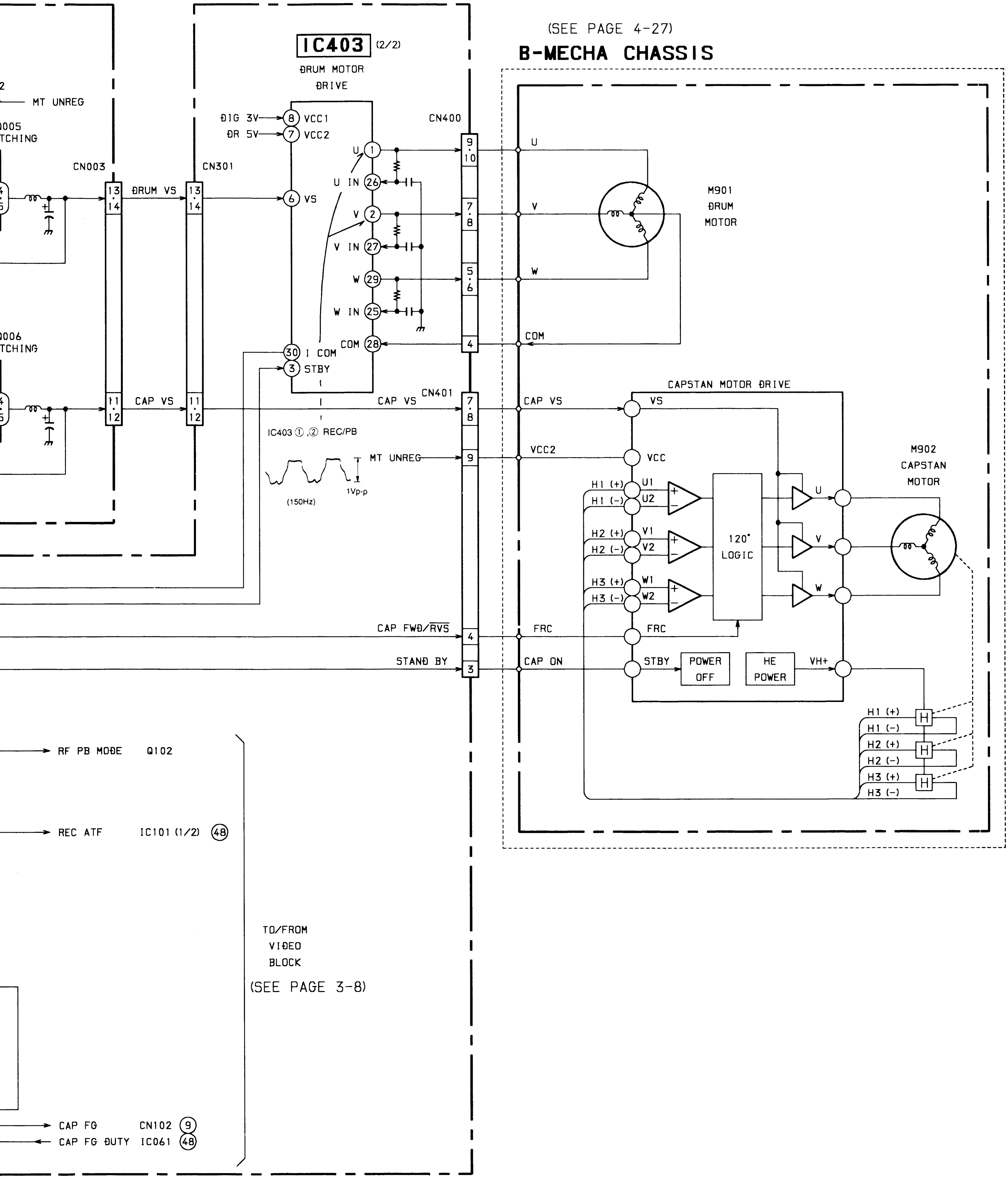

DD-80P BOARD
(SEE PAGE 4-37)
S003 ZOOM
S001 START/STOP
S002 EJECT
S004 STANBY
DIG 3V
CN003
CN301
CN300
ZOOM SW
START/STOP SW
EJECT SW
CAM + STBY SWR
CAM + STBY SW
VC-167P BOARD
(SEE PAGE 4-38)
S301 EDITSEARCH (+)
S302 EDITSAERCH (-)
S303 PLAY
S304 PAUSE
S306 FF
S305 REW
S307 STOP
D319 (DEW)
Q303 LED DRIVE
MT 5V
MA-238 BOARD
(SEE PAGE 4-30)
RS-30E
IC953
SIRCS VCC
SIRCS SIG
CN951
CN501
DIG 5V
PW-108 BOARD
(SEE PAGE 4-43)
S490 CAMERA
S491 PLAYER
CN583
CN482
CAM + STBY SW
VTR MODE SW
CF-40 BOARD
(SEE PAGE 4-43)
CN480
IC303
MODE CONTROL
ZOOM SW
SYS/ SW
EJECT SW
CAM + STBY SW
KEY AD1
KEY AD0
DEW LED
SIRCS IN
XTAL
X302
XO
XI
XTL301
E ZOOM ON SW
VTR MODE SW
DATE SW
TIME SW
KEY AD2
REC LP SW
BACK LIGHT SW
S/S MODE SW
RMC OFF SW
PROGRAM AE
BEEP
BATT SENSE
VTR UNREG
VCC
AVCC
VCC
RESET
LI PREEND
BATT IN
MV RESET
MV STBY
CS MECAM
HI SI
HI SO
HI SCK
CC DOWN SW
PBV
PBV
CAM DD ON
CAM HD
XDO
XDI
FL300
VDW1
VDB1
VDWO
VDBO
N.C.
TALLY LED
DATA OUT
DATA IN
WAKE UP
VTR DD ON
STEADY ON SW
WIDE ON SW
IC303 ③ REC/PB
(10MHz)
2.3Vp-p
IC303 ⑧ REC/PB
(50Hz)
3.1Vp-p
IC303 ⑳ REC/PB
H
3.1Vp-p
IC303 ⑲ REC/PB
(32.768kHz)
1.7Vp-p
IC301
INTIAL RESET
V OUT
V IN
RESET
PREEND
VRO
CS
V BAT
PS301
VTR UNREG
EVER 3V
D316
LI BATT
S300 E ZOOM
OFF
ON
S480 DATE (+)
S481 TIME (NEXT)
S301 TITLE
S482 COUNTER RESET
S483 REC MODE
SP
LP
S484 BACK LIGHT
S485 START/STOP
5SEC
S487 COMMANDER
ON
OFF
S488 BEEP
ON
OFF
S489 PROGRAM AE
BU480 (BUZZER)
IC302
LANC I/O
DATA IN
DATA OUT
WAKE UP
CONT
VCC
UNREG
DC
I/O
EVER 3V
VTR UNREG
J480
LANC
S486
OFF ← WIDE
DIG 3V
EVF 5V
Q305 LED DRIVER
D480 (TALLY)
J481
HEADPHONE
CN480
HP R
HP L
MV RESET
MV STBY
CS MECAM
HI SI
HI SO
HI SCK
CC DOWN SW
PBV
CAM DD ON
CAM HD
REC VDW
REC VDB
DS VDW
EVF C
EVF Y
CN481
EVF Y
EVF C
TALLY LED
EVF UNREG
EVF 15V
EVF 5V
VTR DD ON
HP R CN300 ③
HP L CN300 ①
FROM AUDIO BLOCK
(SEE PAGE 3-8)
MV RESET IC400 ㊳
MV STBY IC400 ㊸
CS MECAM IC400 ㊷
HI SI IC400 ㊹
HI SO IC400 ㊸
HI SCK IC400 ㊺
CC DOWN SW CN402 ⑮
PBV IC400 ⑨
TO/FROM SYSCON BLOCK
(SEE PAGE 3-11)
CAM DD ON Q703, 704
CAM HD IC706 (58), IC604 ②
TO/FROM CAMERA BLOCK
(SEE PAGE 3-6)
REC VDW IC201 ㉑
REC VDB IC201 ㉒
DS VDW Q064
EVF C Q060
EVF Y Q065
TO/FROM VIDEO BLOCK
(SEE PAGE 3-8)
EVF Y
EVF C
TALLY
EVF UNREG
EVF 15V
EVF 5V
TO EVF BLOCK
(SEE PAGE 3-13)
VTR DD ON
TO POWER BLOCK
(SEE PAGE 3-19)
16

3-6. EVF BLOCK DIAGRAM

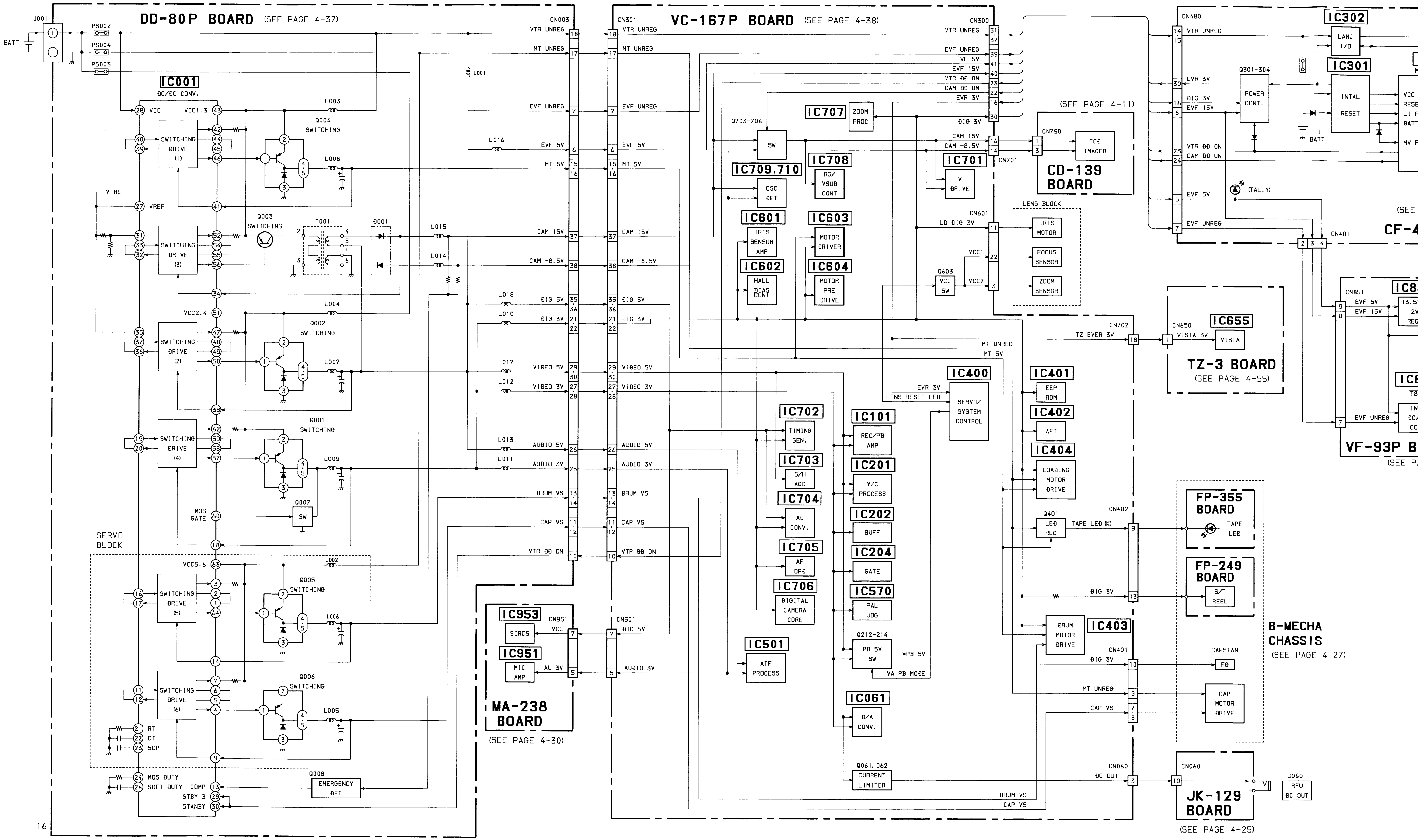

VF-93P BOARD
(SEE PAGE 4-46)
VF-94P BOARD
(SEE PAGE 4-47)
LB-44 BOARD
(SEE PAGE 4-47)
FROM MODE CONT BLOCK
(SEE PAGE 3-12)
CN851
CN852
CN901
CN835
CN801
CN903
CN902
EVF Y
EVF C
NC
TALLY
EVF UNREG
EVF 15V
EVF 5V
Y/COMP CONT
D851
TALLY
DI
DO
LD
EVF CLK
SYNC
INV CUR
13.5V
12V
IC852 REG
IC851
DC/AC CONV
VCC1
VCC2
CB
SYNC
CT
TRIANGLE OSC
Q853
DISCHARGE SW
SCP
SCP COMP
PWM COMP
OUT
INV SW
T851
D852
D853
PRO DET
CURRENT ERR AMP
V REF 2.5V
HIGH
LOW
BACK LIGHT
IC903 ⑳ REC
20msec
3.5Vp-p
IC901 ③ REC
0.50Vp-p
H
Q902
Y COMP SW
IC903
D/A CONV. (EVR)
VDD
VCC
SEL
COLOR
BRIGHT
SUB BRT R
SUB BRT B
CONTRAST
SUB CONT R
SUB CONT B
GAMMA1
CLK
INV CUR
VCO
BLL
Q903
BURST CLEANING
IC901
RGB DECODER
VIDEO
C IN
VCC1
VCC2
R.G.B DECODER
SUB BRT R
SUB BRT B
VCOI
VCOO
X901
4.43MHz
H FIL OUT
SYNC SEP
BURST OUT
SYNC IN
SYNC OUT
R
G
B
Q901
LPF
BUFFER
IC901 ⑳ REC
IC901 ㉒ REC
IC901 ㉔ REC
9.6Vp-p
V VDD
H VDD
RGT
R OUT
G OUT
B OUT
COM
COLOR LCD
IC902
LCD TIMMING GEN.
FRP
SYNC
HD
HCK1
HCK2
HST1
VCK1
VCK2
VST1
EN
CLR
HST
VST
IC903 ⑲ REC
3.5Vp-p
20msec
IC901 ⑯ REC
480mVp-p
(4.43MHz)
EVF 5V
3.2V
IC904
REG
VDD
CKI
CKO
RPD
SLYT
LPF
IC902 ㊴ REC
1.7Vp-p
(10.968MHz)
R OUT
G OUT
B OUT
LC COM
SLYT
PCO
TEST CONNECT
16

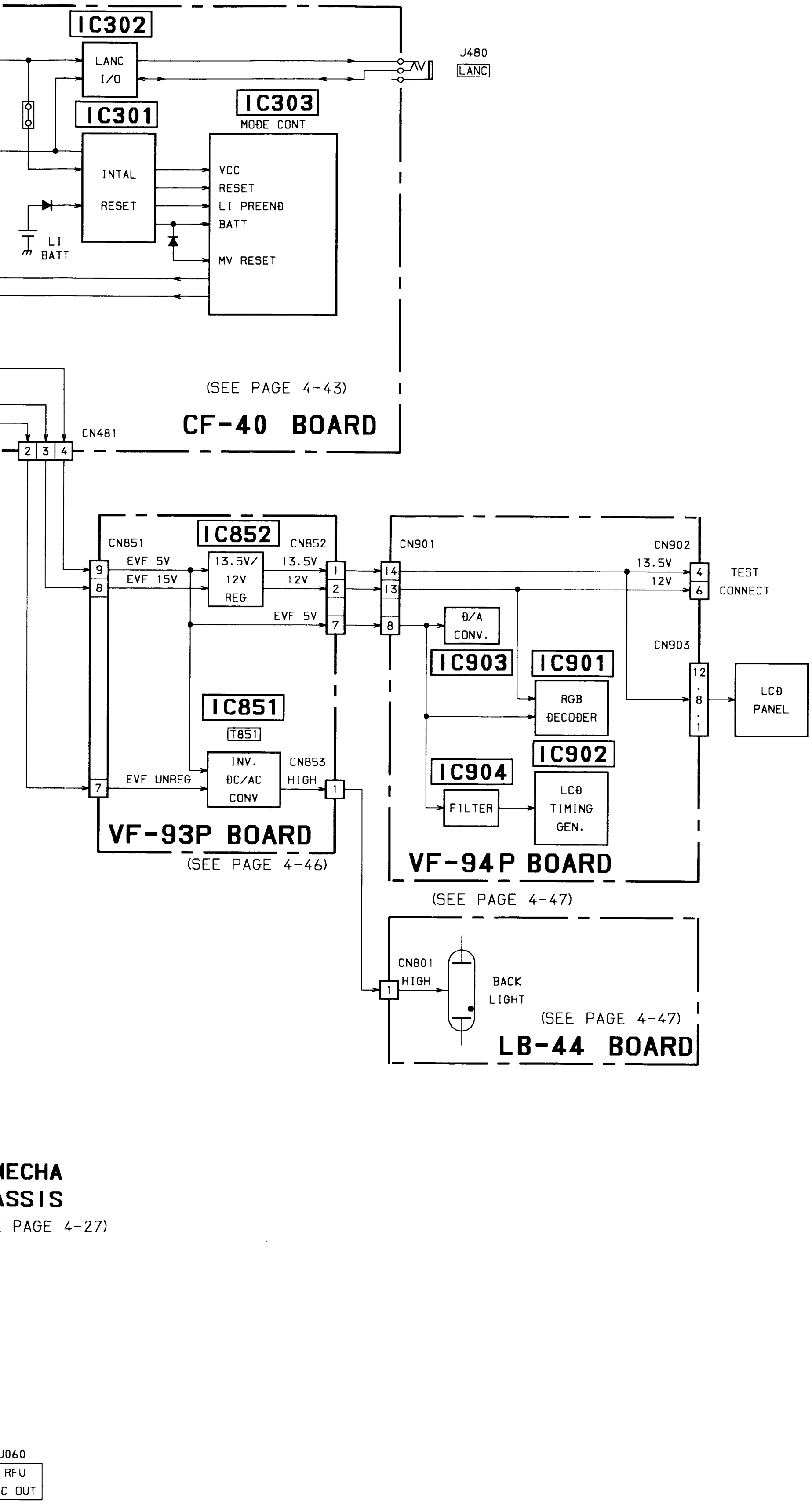
3-7. SERVO BLOCK DIAGRAM (SEE PAGE 4-27)


B-MECHA CHASSIS
DRUM
FG
PG
CAPSTAN FG
VCC1
(+)
(-)
CAP FG WAVE SHAPER
VC-167P BOARD
(SEE PAGE 4-27)
CN400
FG
FG/PG COM
PG
CN401
DIG 3V
FG OUT
OFFSET ADJ
IC403 (1/2)
WAVE SHAPER
FG IN
FG OUT
V REF
PG IN
PG OUT
IC403 ⑱ REC/PB
(300Hz)
3Vp-p
IC403 ⑪ REC/PB
(450Hz)
0.6Vp-p
IC400 ㊽,㊍ REC/PB
(1.148kHz)
3Vp-p
IC400 (2/2)
SERVO CONTROL (MECHA CONT)
DRUM FG
DRUM PG
DRUM PWM
CAPSTAN SERVO
IC400 ㊻ REC/PB
(25Hz)
3Vp-p
CAP FG
CAP FG
ATF ERROR
REF PILOT
MECHA CONTROL
DRUM ON
C FG HMS
CAP FWD/RVS
CAP ON
EVER 3V
AVREF
AVDD
VDD
IC400 ㊆ REC/PB
(5.859MHz)
3.8Vp-p
RP PB MODE
5.9M ATF CLK
ATF STBY
CF ATF
FROM SYSCON BLOCK
IC400 (1/2) ㊄ MEC SCK
IC400 (1/2) ㊃ MEC SO
IC400 (1/2) ㉙ PB RF
(SEE PAGE 3-10)
IC404 (4/4)
L.P.H
L.P.F
L.P.F
B IN2
B OUT2
ISNF
B IN1
B OUT1
FR B
IC400 ㊼ REC/PB
(300Hz)
3Vp-p
CN301
DRUM ERR
CAP ERR
IC402 (2/2)
ATF SERVO
REF PILOT
CLK 5.9M
STBY
CS
SCLK
S IN
PB IN
L.P.F AMP
MOD
16KHz B.P.F
47KHz B.P.F
L.P.F
L.P.F
FH
3FH
DIG 3V
AVDD
V REF
L.P.F
RF PB MODE Q102
REC ATF IC101 (1/
CAP FG CN102
CAP FG DUTY IC061
DD-80P BOARD (SEE PAGE 4-37)
IC001 DURUM/CAP PWM DRIVE
(1/3)
CN003
VCC 5.6
SWITCHING DRIVE (5)
SWITCHING DRIVE (6)
RT
CT
SCP
MDS DUTY
SOFT DUTY
L002
MT UNREG
Q005 SWITCHING
Q006 SWITCHING
CN003
DRUM VS
CAP VS


(SEE PAGE 4-27)
B-MECHA CHASSIS
IC403 (2/2)
DRUM MOTOR DRIVE
DIG 3V
DR 5V
8 VCC1
7 VCC2
U 1
U IN 26
6 VS
V 2
V IN 27
W 29
W IN 25
COM 28
30 I COM
3 STBY
CN400
CN401
CN003
CN301
MT UNREG
DRUM VS
CAP VS
13 14
11 12
U
V
W
COM
M901
DRUM
MOTOR
CAPSTAN MOTOR DRIVE
CAP VS
VS
VCC2
VCC
MT UNREG
IC403 ①,② REC/PB
1Vp-p
(150Hz)
H1 (+)
H1 (-)
H2 (+)
H2 (-)
H3 (+)
H3 (-)
U1
U2
V1
V2
W1
W2
120° LOGIC
M902
CAPSTAN
MOTOR
CAP FWD/RVS
FRC
STAND BY
CAP ON
STBY
POWER OFF
HE POWER
VH+
RF PB MODE Q102
REC ATF IC101 (1/2) 48
TO/FROM VIDEO BLOCK
(SEE PAGE 3-8)
CAP FG CN102 9
CAP FG DUTY IC061 48

3-8. POWER BLOCK DIAGRAM

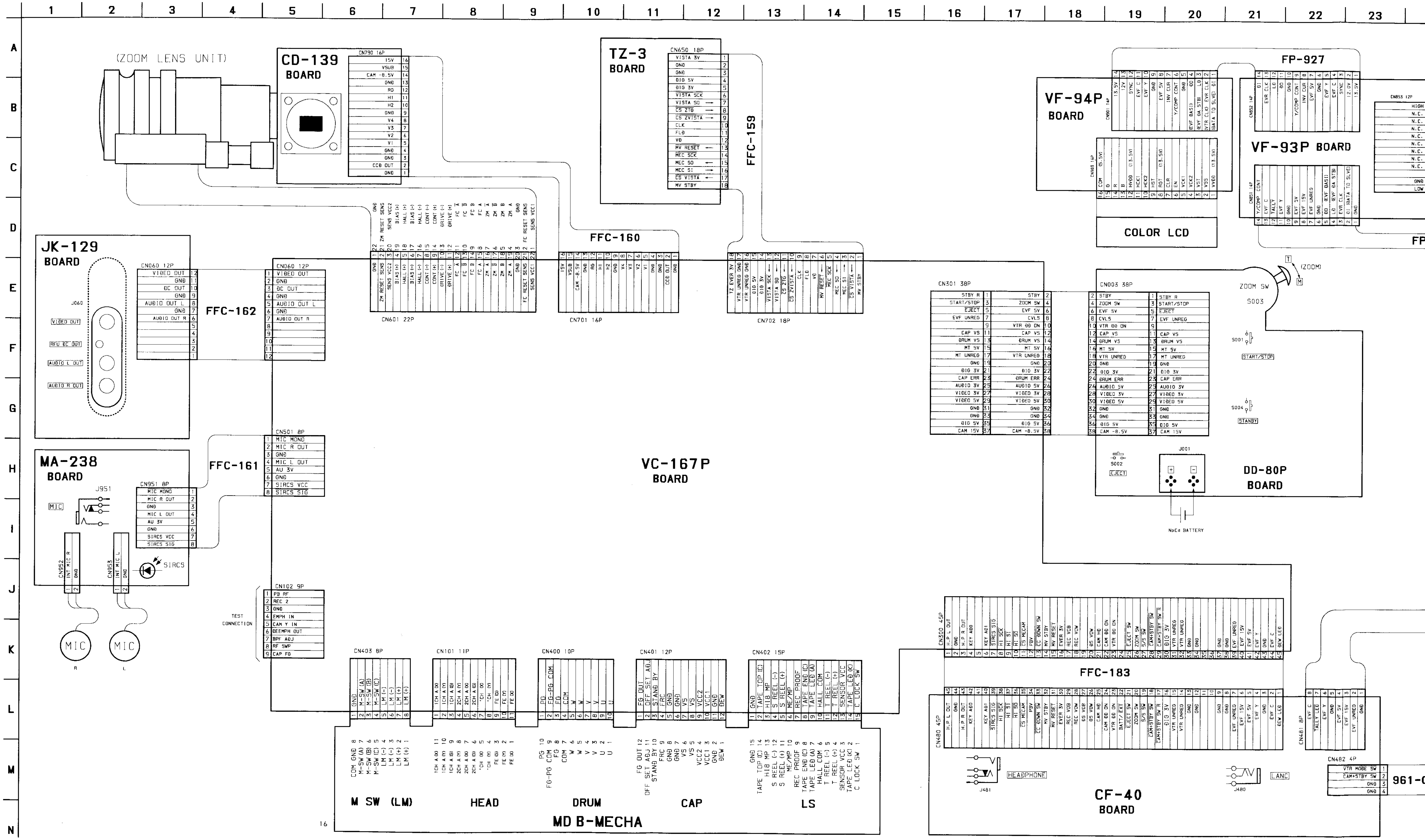

DD-80P BOARD (SEE PAGE 4-37)
J001
BATT
PS002
PS004
PS003
IC001
DC/DC CONV.
VCC
VCC1.3
SWITCHING DRIVE (1)
SWITCHING DRIVE (2)
SWITCHING DRIVE (3)
SWITCHING DRIVE (4)
SWITCHING DRIVE (5)
SWITCHING DRIVE (6)
V REF
VREF
VCC2.4
VCC5.6
MOS GATE
SERVO BLOCK
RT
CT
SCP
MOS DUTY
SOFT DUTY
COMP
STBY B
STANBY
Q004 SWITCHING
Q003 SWITCHING
Q002 SWITCHING
Q001 SWITCHING
Q005 SWITCHING
Q006 SWITCHING
Q007 SW
Q008 EMERGENCY DET
T001
D001
L001
L002
L003
L004
L005
L006
L007
L008
L009
L010
L011
L012
L013
L014
L015
L016
L017
L018
CN003
VTR UNREG
MT UNREG
EVF UNREG
EVF 5V
MT 5V
CAM 15V
CAM -8.5V
DIG 5V
DIG 3V
VIDEO 5V
VIDEO 3V
AUDIO 5V
AUDIO 3V
DRUM VS
CAP VS
VTR DD ON
MA-238 BOARD (SEE PAGE 4-30)
IC953 SIRCS
IC951 MIC AMP
CN951
VCC
AU 3V
VC-167P BOARD (SEE PAGE 4-38)
CN301
CN300
CN501
EVR 3V
VTR DD ON
CAM DD ON
IC707 ZOOM PROC
Q703-706 SW
IC708 RG/VSUB CONT
IC709,710 OSC DET
IC701 V DRIVE
IC601 IRIS SENSOR AMP
IC602 HALL BIAS CONT
IC603 MOTOR DRIVER
IC604 MOTOR PRE DRIVE
CN701
CN601
LD DIG 3V
VCC1
VCC2
Q603 VCC SW
LENS BLOCK
IRIS MOTOR
FOCUS SENSOR
ZOOM SENSOR
CN790
CCD IMAGER
CD-139 BOARD (SEE PAGE 4-11)
IC400 SERVO/SYSTEM CONTROL
LENS RESET LED
IC401 EEP ROM
IC402 AFT
IC404 LOADING MOTOR DRIVE
IC702 TIMING GEN.
IC703 S/H AGC
IC704 AD CONV.
IC705 AF OPD
IC706 DIGITAL CAMERA CORE
IC101 REC/PB AMP
IC201 Y/C PROCESS
IC202 BUFF
IC204 GATE
IC570 PAL JOG
IC501 ATF PROCESS
Q212-214 PB 5V SW
PB 5V
VA PB MODE
IC061 D/A CONV.
Q061, 062 CURRENT LIMITER
Q401 LED REG
TAPE LED (K)
IC403 DRUM MOTOR DRIVE
CN702
TZ EVER 3V
CN402
CN401
CN060
DC OUT
CN650
VISTA 3V
IC655 VISTA
TZ-3 BOARD (SEE PAGE 4-55)
FP-355 BOARD
TAPE LED
FP-249 BOARD
S/T REEL
CAPSTAN
FG
CAP MOTOR DRIVE
B-MECHA CHASSIS (SEE PAGE 4-27)
CN060
JK-129 BOARD (SEE PAGE 4-25)
J060 RFU DC OUT
CN480
CN481
IC302 LANC I/O
IC301 INTAL RESET
Q301-304 POWER CONT.
LI BATT
(TALLY)
EVF 15V
CF-4
CN851
IC8
13.5
12V
REG
VF-93P B
(SEE P

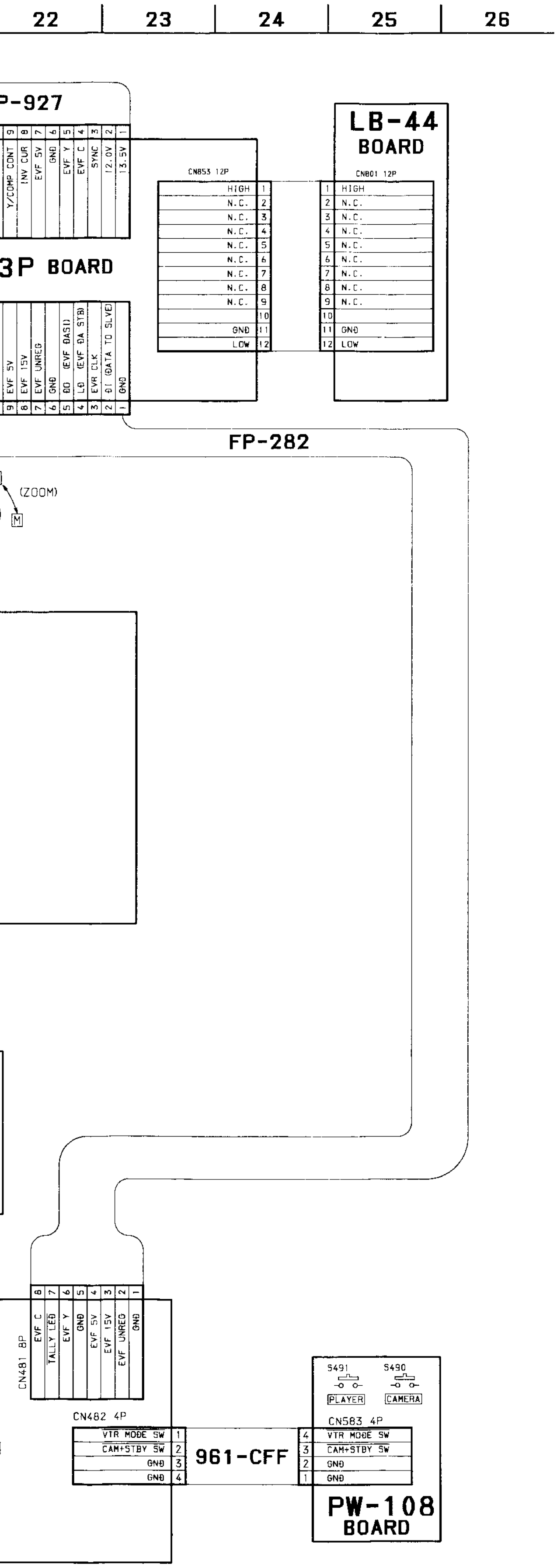

IC302
LANC
I/O
J480
LANC
IC301
INTAL
RESET
LI
BATT
IC303
MODE CONT
VCC
RESET
LI PREEND
BATT
MV RESET
(SEE PAGE 4-43)
CF-40 BOARD
CN481
2
3
4
CN851
EVF 5V
EVF 15V
IC852
13.5V/
12V
REG
CN852
13.5V
12V
EVF 5V
9
8
1
2
7
IC851
T851
INV.
DC/AC
CONV
CN853
HIGH
EVF UNREG
7
1
VF-93P BOARD
(SEE PAGE 4-46)
CN901
14
13
8
D/A
CONV.
IC903
IC901
RGB
DECODER
IC904
FILTER
IC902
LCD
TIMING
GEN.
CN902
13.5V
12V
4
6
TEST
CONNECT
CN903
12
8
1
LCD
PANEL
VF-94P BOARD
(SEE PAGE 4-47)
CN801
HIGH
1
BACK
LIGHT
(SEE PAGE 4-47)
LB-44 BOARD
IECHA
ASSIS
PAGE 4-27)
J060
RFU
C OUT

SECTION 4

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


(ZOOM LENS UNIT)
CD-139 BOARD
CN790 16P
TZ-3 BOARD
CN650 18P
FFC-159
FFC-160
VF-94P BOARD
FP-927
VF-93P BOARD
COLOR LCD
JK-129 BOARD
CN060 12P
J060
VIDEO OUT
RFU DC OUT
AUDIO L OUT
AUDIO R OUT
FFC-162
CN601 22P
CN701 16P
CN702 18P
CN301 38P
CN003 38P
ZOOM SW
S003
(ZOOM)
S001
START/STOP
S004
STANBY
MA-238 BOARD
J951
MIC
CN951 8P
FFC-161
CN501 8P
SIRCS
CN952
CN953
MIC
R
L
VC-167P BOARD
S002
EJECT
J001
DD-80P BOARD
NiCd BATTERY
CN102 9P
TEST CONNECTION
CN403 8P
CN101 11P
CN400 10P
CN401 12P
CN402 15P
CN300 45P
FFC-183
CN480 45P
CN481 8P
CN482 4P
J481
HEADPHONE
J480
LANC
CF-40 BOARD
M SW (LM)
HEAD
DRUM
CAP
LS
MD B-MECHA
16

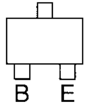

22
23
24
25
26
P-927
Y/COMP CONT
INV CUR
EVF 5V
GND
EVF Y
EVF C
SYNC
12.0V
13.5V
3P BOARD
EVF 5V
EVF 15V
EVF UNREG
GND
BO (EVF DAS1)
LD (EVF DA STB)
EVR CLK
DI (DATA TO SLVE)
GND
CN853 12P
HIGH
N.C.
GND
LOW
LB-44
BOARD
CN801 12P
HIGH
N.C.
GND
LOW
FP-282
(ZOOM)
M
CN481 8P
EVF C
TALLY LED
EVF Y
GND
EVF 5V
EVF 15V
EVF UNREG
GND
CN482 4P
VTR MODE SW
CAM+STBY SW
GND
GND
961-CFF
CN583 4P
VTR MODE SW
CAM+STBY SW
GND
GND
S491
S490
PLAYER
CAMERA
PW-108
BOARD

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- •—— : indicated a lead wire mounted on the component side.
- ▨ :Pattern from the side which enables seeing. (The other layers' patterns are not indicated.)
- ● :Through hole is omitted.
- Printed wiring board which has four layers structure but inner two layers' patterns are omitted.

Caution:
SIDE A: The pattern face side which is seen when the upper case is opened.
SIDE B: The opposite pattern face side to the pattern seen when the upper case is opened.

- Chip parts (3-terminal transistor)



C: Collector
B: Base
E: Emitter

- **For schematic diagrams.**
- Caution when replacing chip parts.. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistor are in ohms, 1/4W unless otherwise noted. Chip resistor are 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ, : 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μ μF. 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ∿ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair. *
- ━━ : B+ Line. *
- - - - : B− Line. *
- ⇨ : IN/OUT direction of (+,−) B LINE. *
- Circled numbers refer to waveforms. *
- Signal name

*E/—L→E/$\overline{L}$ *—VAPB→$\overline{VAPB}$
—EDIT→$\overline{EDIT}$ *VAPB→VAPB

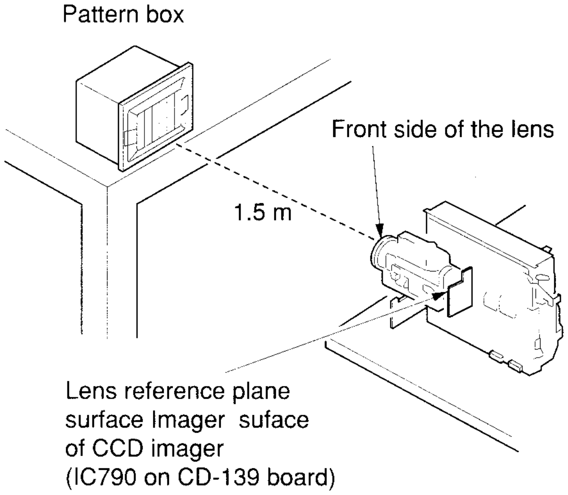
NOTE: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- * : indicated by the color red.

- Voltages and waveforms are measured between the measurement points and ground when camera shoots color bar chart of pattern box. They are reference values * and reference waveforms. (VOM of DC 10 MΩ input impedance is used.).
- Voltage values change depending upon input impedance of VOM used.)

1. Connection


Pattern box
Front side of the lens
1.5 m
Lens reference plane surface Imager suface of CCD imager (IC790 on CD-139 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

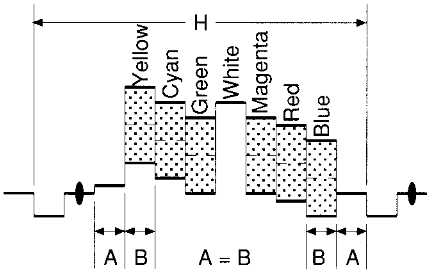

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
B
A = B
B
A

Fig. a (Video output terminal output waveform)

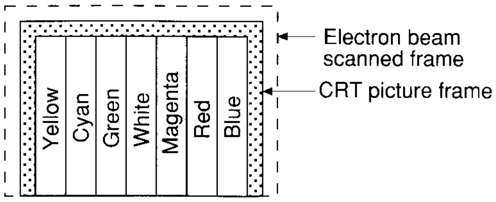

Yellow
Cyan
Green
White
Magenta
Red
Blue
Electron beam scanned frame
CRT picture frame

Fig. b (Picture on monitor TV)

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

VC-167P BOARD

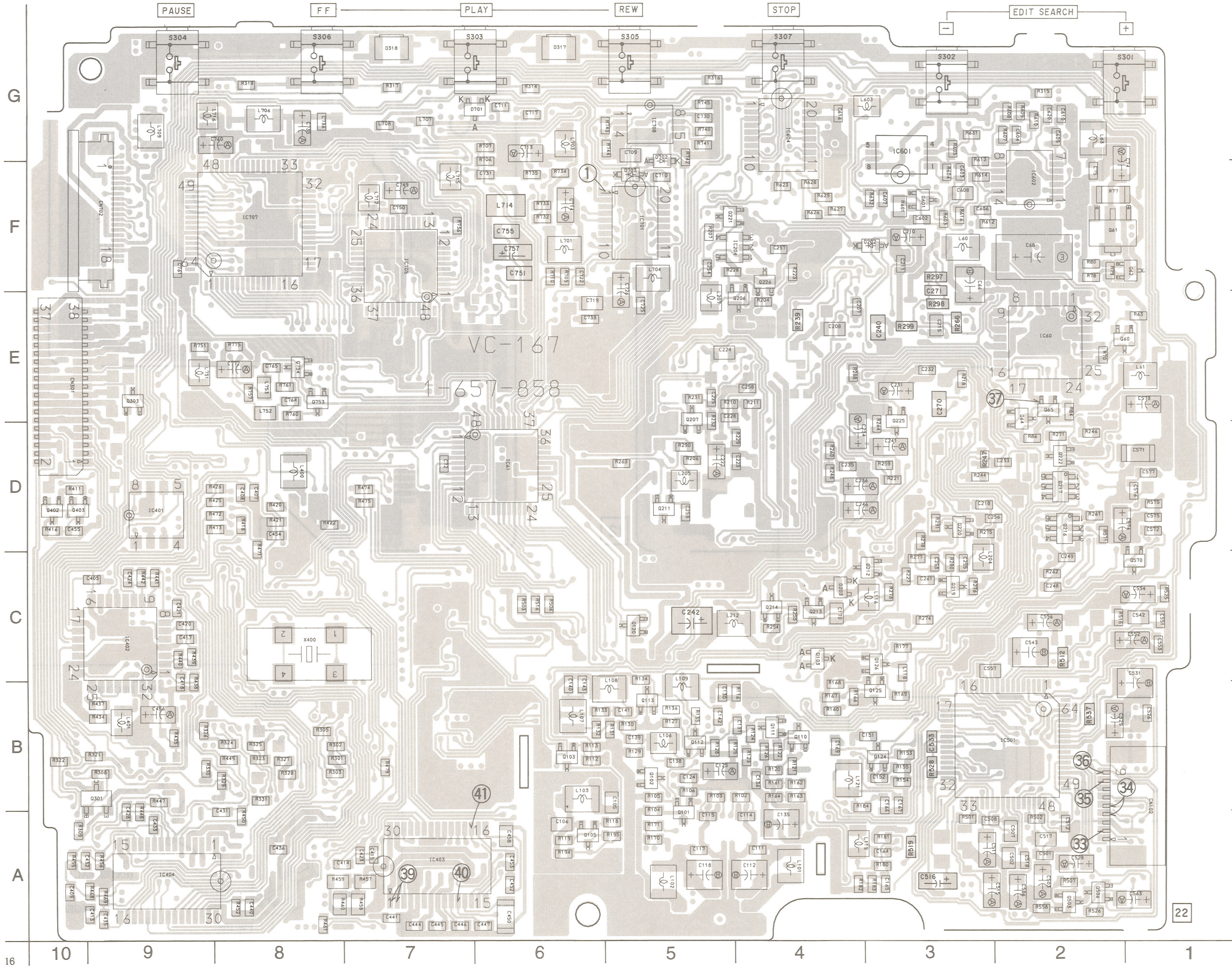
C061	(B)F-2
C069	(B)D-3
C072	(A)D-7
C073	(B)D-6
C075	(A)F-2
C076	(B)E-2
C077	(B)E-2
C078	(B)E-2
C101	(B)A-4
C102	(B)A-5
C103	(B)A-4
C104	(B)A-5
C106	(A)A-6
C107	(B)B-6
C108	(B)A-6
C109	(B)A-6
C110	(B)A-6
C111	(A)A-4
C112	(A)A-4
C113	(B)A-4
C114	(A)A-4
C115	(A)A-5
C116	(B)A-5
C117	(A)A-5
C118	(A)A-5
C119	(B)A-5
C120	(B)A-5
C121	(B)B-5
C122	(B)B-5
C123	(B)B-5
C124	(A)B-5
C125	(A)B-5
C127	(B)B-5
C128	(B)B-5
C129	(B)B-5
C130	(A)B-5
C134	(B)B-4
C135	(A)A-4
C136	(A)B-4
C137	(A)B-4
C138	(A)B-5
C139	(A)B-5
C140	(A)B-6
C141	(A)B-5
C142	(A)B-5
C143	(A)B-6
C148	(B)B-3
C149	(B)B-3
C150	(B)B-3
C152	(A)B-3
C153	(B)B-4
C154	(B)B-3
C155	(B)B-3
C156	(B)B-4
C157	(B)C-3
C160	(B)B-5
C162	(B)A-3
C163	(B)A-3
C164	(A)A-3
C165	(A)A-3
C166	(A)B-3
C167	(A)B-3
C168	(B)A-4
C169	(A)B-4
C170	(A)C-4
C171	(B)C-6
C202	(B)E-3
C203	(B)F-3
C204	(B)E-3
C205	(B)F-3
C206	(B)F-3
C207	(A)E-4
C208	(A)E-4
C209	(B)F-4
C210	(A)F-3
C211	(A)F-3
C212	(B)F-4
C213	(B)F-3
C214	(B)F-3
C215	(A)E-3
C216	(B)G-2
C217	(B)G-2
C218	(A)D-3
C219	(B)F-4
C223	(A)D-4
C224	(A)E-5
C225	(A)E-5
C226	(B)D-5
C227	(B)D-5
C229	(B)D-5
C230	(B)D-5
C231	(A)E-3
C232	(A)E-3
C233	(A)D-2
C234	(A)D-4
C235	(A)D-4
C236	(A)D-4
C237	(B)D-4
C238	(B)D-3
C240	(A)E-3
C242	(A)C-5
C243	(B)F-3
C244	(B)D-4
C245	(B)E-4
C246	(A)D-4
C247	(B)D-2
C248	(A)C-2
C249	(A)C-2
C252	(B)D-5
C254	(A)F-5
C256	(A)D-3
C257	(A)F-4
C260	(B)D-6
C263	(B)D-2
C265	(B)D-3
C266	(B)D-3
C267	(B)E-5
C269	(B)E-3
C270	(A)E-3
C271	(A)E-3
C400	(B)C-8
C401	(B)C-8
C402	(B)B-9
C403	(B)C-8
C404	(B)D-8
C405	(A)C-9
C406	(B)C-9
C407	(A)D-8
C408	(A)D-8
C409	(A)A-10
C411	(B)B-9
C412	(B)B-9
C413	(A)A-9
C414	(A)A-8
C415	(A)A-7
C416	(B)D-9
C417	(A)C-9
C418	(A)B-9
C419	(B)C-9
C420	(A)C-9
C421	(A)C-9
C423	(A)A-7
C424	(A)C-9
C425	(B)B-9
C426	(B)A-9
C427	(B)A-9
C428	(A)A-9
C429	(B)A-9
C430	(B)A-9
C431	(A)A-8
C432	(A)A-9
C433	(A)A-9
C434	(B)B-8
C435	(A)A-9
C436	(A)A-8
C437	(B)A-7
C438	(B)A-7
C439	(B)A-7
C441	(A)A-7
C442	(B)A-10
C443	(B)A-9
C444	(A)A-7
C445	(A)A-7
C446	(A)A-7
C447	(A)A-6
C448	(B)A-6
C449	(B)A-7
C450	(A)A-6
C451	(B)A-6
C452	(A)A-6
C453	(A)A-6
C456	(A)B-9
C458	(A)A-6
C502	(A)A-2
C505	(B)A-2
C506	(A)A-2
C507	(A)A-2
C511	(A)A-3
C512	(A)A-2
C515	(A)A-3
C516	(A)A-3
C517	(A)A-2
C520	(B)C-2
C521	(B)B-2
C522	(B)B-3
C523	(B)B-2
C525	(B)A-2
C526	(A)B-1
C528	(A)A-2
C529	(A)B-2
C530	(B)B-3
C531	(A)C-1
C532	(B)B-3
C533	(A)B-3
C534	(B)B-3
C535	(B)B-2
C537	(B)B-2
C538	(B)A-3
C540	(B)C-2
C542	(A)C-1
C543	(A)C-2
C544	(B)B-2
C544	(B)B-2
C546	(B)C-1
C548	(A)C-2
C550	(B)A-2
C553	(A)C-1
C556	(A)C-2
C557	(A)C-3
C558	(B)C-2
C561	(B)A-2
C563	(A)A-1
C571	(A)D-1
C572	(A)D-1
C573	(A)E-1
C574	(A)D-1
C575	(A)D-1
C576	(A)D-1
C577	(A)D-1
C578	(B)D-1
C602	(A)F-3
C603	(A)F-3
C604	(A)G-2
C605	(B)F-2
C606	(A)F-3
C607	(A)F-3
C608	(A)F-3
C609	(A)G-2
C610	(A)G-2
C611	(B)G-3
C612	(B)G-3
C613	(B)F-5
C614	(B)F-4
C615	(B)F-4
C616	(A)G-4
C618	(B)G-3
C619	(B)G-3
C620	(A)G-2
C701	(B)G-5
C702	(B)G-5
C703	(B)G-5
C704	(B)F-5
C706	(B)F-5
C707	(B)G-5
C708	(B)G-5
C710	(A)F-5
C711	(A)G-6
C712	(B)G-6
C713	(A)G-6
C714	(A)F-6
C715	(B)F-6
C717	(A)G-6
C718	(B)G-6
C719	(A)E-6
C720	(B)F-5
C722	(A)F-6
C724	(B)G-6
C725	(A)E-5
C726	(A)F-5
C727	(B)F-5
C728	(B)E-5
C729	(B)E-5
C730	(A)G-5
C731	(A)F-6
C732	(B)E-6
C734	(B)G-6
C735	(A)G-8
C736	(A)G-8
C739	(B)G-7
C740	(B)G-8
C741	(B)G-9
C742	(B)G-9
C745	(B)E-8
C746	(B)F-9
C748	(B)F-9
C749	(A)F-7
C750	(A)F-7
C751	(A)F-6
C755	(A)F-6
C757	(A)F-6
C758	(B)E-6
C759	(B)E-7
C760	(A)G-8
C761	(A)F-9
C772	(A)E-8
CN060	(B)F-1
CN101	(B)A-5
CN102	(A)B-1
CN300	(B)B-8
CN301	(A)E-10
CN400	(B)A-6
CN401	(B)A-7
CN402	(B)A-9
CN403	(B)A-3
CN501	(B)B-1
CN601	(B)G-3
CN701	(B)F-5
CN702	(A)F-9
D101	(B)B-4
D102	(B)B-3
D103	(A)C-4
D201	(B)E-5
D202	(A)F-3
D203	(A)C-4
D302	(B)B-8
D319	(B)G-8
D701	(A)G-6
D702	(A)G-5
D703	(A)F-5
D705	(B)G-8
D706	(B)G-6
IC061	(A)D-6
IC101	(B)B-5
IC201	(B)E-4
IC202	(B)E-3
IC204	(A)F-4
IC400	(B)C-8
IC401	(A)D-9
IC402	(A)C-9
IC403	(A)A-7
IC404	(A)A-9
IC405	(B)C-9
IC501	(A)B-2
IC570	(B)D-2
IC601	(A)G-3
IC602	(A)F-2
IC603	(B)G-4
IC604	(A)G-4
IC701	(A)F-5
IC702	(B)F-6
IC703	(B)E-6
IC704	(B)F-6
IC705	(A)F-7
IC706	(B)F-8
IC707	(A)F-8
IC708	(A)G-5
IC709	(B)G-9
IC710	(B)G-7
L061	(A)E-1
L062	(B)D-6
L063	(A)G-2
L101	(A)A-4
L102	(A)A-5
L103	(A)B-6
L104	(B)B-6
L105	(B)B-5
L106	(A)B-5
L107	(A)B-6
L108	(A)B-5
L109	(A)B-5
L113	(B)B-5
L114	(B)B-3
L115	(B)B-3
L116	(A)C-3
L118	(A)C-3
L119	(A)A-4
L120	(B)B-4
L121	(A)B-4
L202	(B)F-3
L203	(B)E-4
L207	(A)E-5
L210	(B)D-3
L211	(B)D-4
L212	(A)C-5
L213	(B)F-3
L214	(B)D-6
L215	(B)E-5
L216	(B)E-3
L400	(A)D-8
L401	(A)B-9
L570	(B)E-2
L601	(B)G-2
L602	(B)G-4
L603	(A)G-3
L701	(A)F-6
L703	(A)G-6
L704	(A)F-5
L706	(A)G-8
L707	(A)G-7
L708	(A)G-7
L709	(A)G-9
L710	(B)F-10
L712	(A)F-7
L714	(A)F-6
L715	(A)F-7
L716	(A)G-9
L751	(A)E-9
Q060	(A)E-1
Q061	(A)F-2
Q062	(A)F-1
Q063	(B)E-2
Q064	(A)E-2
Q065	(A)E-2
Q101	(A)A-5
Q102	(A)B-5
Q103	(A)B-6
Q104	(B)B-6
Q105	(A)A-6
Q106	(B)A-6
Q107	(B)A-6
Q108	(B)B-4
Q109	(B)B-4
Q110	(A)B-4
Q111	(A)B-4
Q112	(A)B-5
Q113	(A)B-5
Q114	(B)B-6
Q120	(A)C-5
Q123	(B)B-3
Q124	(A)B-3
Q125	(A)B-3
Q126	(A)C-3
Q129	(B)A-3
Q130	(B)A-3
Q131	(B)B-3
Q202	(B)F-4
Q206	(A)E-4
Q208	(A)D-2
Q212	(A)C-3
Q213	(A)C-4
Q214	(A)C-4
Q215	(B)E-5
Q216	(A)D-2
Q217	(A)D-2
Q218	(B)D-2
Q219	(A)C-3
Q221	(A)F-5
Q222	(A)D-2
Q223	(B)D-2
Q224	(B)D-2
Q226	(A)F-4
Q227	(B)D-5
Q303	(A)E-9
Q400	(B)A-9
Q401	(B)A-9
Q501	(B)A-2
Q503	(A)A-2
Q504	(B)A-2
Q506	(A)A-2
Q507	(B)A-2
Q570	(A)C-1
Q601	(A)F-3
Q602	(B)F-2
Q603	(B)G-3
Q701	(B)G-5
Q703	(B)G-10
Q704	(B)G-10
Q705	(B)G-9
Q706	(B)G-9
Q750	(B)E-9
Q752	(B)E-8
R062	(B)D-6
R063	(A)E-1
R077	(A)F-2
R078	(A)F-2
R079	(A)F-2
R080	(A)F-2
R081	(B)E-2
R082	(B)E-2
R083	(B)E-2
R084	(A)E-2
R085	(B)E-2
R086	(A)D-2
R087	(B)E-2
R088	(B)E-2
R091	(B)E-2
R092	(B)E-2
R101	(B)B-6
R102	(A)B-4
R103	(A)B-5
R104	(A)A-5
R105	(A)B-5
R106	(A)B-5
R107	(B)B-5
R108	(B)B-5
R109	(B)B-5
R110	(B)B-6
R111	(B)B-5
R112	(A)B-6
R113	(A)B-6
R114	(B)B-5
R115	(B)C-4
R116	(A)B-4
R117	(B)B-4
R118	(A)A-5
R119	(A)A-6
R120	(A)B-4
R121	(A)B-4
R122	(A)B-4
R123	(A)B-4
R125	(A)B-5
R126	(A)B-4
R127	(A)B-5
R128	(A)B-5
R129	(A)B-5
R130	(A)B-5
R131	(A)B-5
R132	(A)B-6
R133	(A)B-6
R134	(A)B-5
R141	(B)B-4
R149	(B)C-4
R150	(B)B-3
R152	(B)B-4
R153	(A)B-3
R154	(A)B-3
R155	(A)B-3
R156	(B)B-3
R157	(B)B-3
R158	(B)B-3
R159	(B)B-3
R160	(A)B-4
R161	(A)B-4
R162	(A)B-4
R163	(A)B-4
R164	(A)B-4
R165	(B)B-4
R166	(A)B-4
R167	(A)B-4
R168	(A)B-4
R169	(A)B-3
R170	(A)A-5
R171	(A)A-5
R172	(B)A-5
R173	(B)A-5
R176	(B)C-3
R177	(A)C-3
R178	(B)A-3
R179	(B)A-3
R180	(A)A-3
R181	(A)A-3
R182	(A)A-4
R183	(A)A-3
R184	(A)B-4
R185	(B)A-3
R186	(B)A-3
R187	(B)A-3
R188	(B)B-6
R189	(B)B-6
R190	(B)A-6
R191	(B)B-6
R192	(B)A-6
R193	(B)A-6
R194	(A)A-6
R195	(A)A-5
R196	(B)A-6
R197	(B)B-3
R201	(B)F-3
R202	(B)F-3
R203	(B)F-3
R204	(A)E-4
R210	(A)E-5
R212	(B)F-4
R213	(B)F-4
R214	(B)G-1
R215	(B)G-1
R216	(B)G-2
R218	(A)E-3
R219	(B)D-4
R220	(B)D-4
R221	(A)D-3
R222	(B)E-4
R223	(A)F-4
R225	(B)D-2
R228	(A)F-5
R229	(A)D-4
R230	(B)D-4
R232	(B)E-5
R234	(B)E-4
R235	(B)D-4
R239	(A)E-4
R241	(B)E-4
R243	(B)D-3
R244	(A)D-2
R246	(A)D-2
R247	(A)D-2
R248	(A)D-4
R249	(B)D-3
R254	(A)C-4
R255	(A)C-4
R256	(B)D-2
R257	(B)D-2
R259	(A)D-3
R260	(A)D-4
R261	(A)D-2
R262	(A)C-2
R265	(B)D-2
R266	(A)E-3
R267	(B)D-4
R268	(B)D-2
R270	(B)D-2
R271	(A)D-2
R272	(B)D-2
R273	(A)C-3
R274	(A)C-3
R276	(A)C-3
R277	(A)C-3
R279	(B)C-3
R281	(B)D-3
R283	(B)D-3
R284	(B)D-2
R286	(B)D-2
R287	(B)D-3
R289	(B)D-3
R290	(A)D-5
R291	(A)D-3
R293	(B)E-5
R294	(B)E-3
R295	(B)E-3
R296	(B)E-3
R297	(A)E-3
R298	(A)E-3
R299	(A)E-3
R301	(A)B-8
R302	(A)B-8
R303	(A)B-8
R304	(B)B-8
R305	(A)B-8
R307	(B)B-8
R314	(A)G-6
R315	(A)G-2
R316	(A)G-5
R317	(A)G-7
R318	(A)G-8
R319	(B)B-9
R320	(B)B-9
R321	(A)B-9
R327	(A)B-8
R328	(A)B-8
R329	(A)B-8
R330	(A)B-9
R331	(A)B-8
R333	(B)D-9
R334	(B)G-8
R400	(B)B-7
R401	(B)B-7
R402	(B)B-7
R403	(B)C-7
R404	(B)C-7
R405	(B)C-7
R406	(B)C-7
R407	(B)C-7
R408	(B)B-7
R409	(B)B-7
R410	(B)B-7
R411	(A)D-10
R412	(B)C-7
R413	(B)C-7
R414	(B)C-7
R417	(B)C-8
R418	(A)D-8
R419	(B)C-7
R420	(A)D-8
R421	(A)D-8
R422	(A)D-8
R423	(B)D-9
R424	(B)C-9
R425	(A)D-8
R426	(A)D-8
R427	(B)C-9
R428	(B)C-9
R429	(B)A-9
R430	(B)B-8
R434	(A)B-9
R436	(B)D-9
R437	(A)B-9
R439	(A)C-9
R440	(A)C-9
R441	(A)C-9
R442	(A)C-9
R444	(B)A-10
R445	(B)B-10
R446	(B)A-10
R447	(A)B-9
R448	(A)A-9
R449	(A)B-8
R450	(A)A-8
R451	(B)A-8
R452	(A)A-8
R453	(B)A-8
R454	(B)A-8
R455	(A)A-10
R456	(A)A-9
R458	(A)A-7
R459	(A)A-8
R460	(A)A-8
R461	(A)A-8
R462	(B)A-7
R463	(B)A-7
R464	(B)A-7
R465	(B)A-6
R466	(B)C-9
R467	(B)A-9
R468	(A)A-9
R469	(A)A-9
R471	(A)D-8
R472	(A)D-8
R473	(A)D-8
R474	(A)D-7
R475	(A)D-7
R476	(B)C-7
R477	(B)C-7
R478	(B)C-7
R479	(A)B-7
R481	(B)A-9
R482	(B)A-9
R501	(A)A-3
R502	(A)A-2
R503	(A)C-6
R505	(A)A-2
R506	(A)C-6
R507	(A)A-2
R511	(B)B-3
R512	(A)C-2
R513	(B)A-3
R514	(B)C-2
R515	(A)C-2
R516	(B)C-6
R517	(A)C-2
R519	(A)A-3
R522	(B)A-2
R523	(A)B-3
R526	(A)A-2
R527	(B)A-1
R528	(A)B-3
R529	(B)A-2
R531	(B)A-1
R532	(B)C-6
R533	(B)B-2
R537	(A)B-2
R556	(B)A-1
R557	(B)A-2
R558	(A)A-2
R570	(B)C-1
R571	(A)D-2
R575	(A)D-1
R581	(B)D-1
R601	(A)F-3
R603	(A)F-3
R604	(A)F-3
R605	(A)G-3
R606	(B)F-3
R607	(A)G-2
R608	(A)G-2
R609	(A)G-2
R610	(A)G-2
R611	(B)F-2
R612	(A)F-3
R613	(A)F-3
R614	(A)F-3
R615	(B)F-3
R616	(A)F-3
R618	(B)F-2
R619	(B)G-2
R620	(B)G-2
R621	(B)G-2
R623	(A)F-4
R628	(A)F-4
R629	(A)F-4
R630	(B)G-3
R631	(A)G-3
R632	(A)F-3
R701	(B)G-5
R702	(B)G-5
R703	(B)F-5
R704	(B)G-5
R706	(A)G-6
R707	(A)G-6
R708	(B)F-9
R709	(A)F-6
R710	(A)F-6
R713	(B)G-8
R714	(B)G-7
R715	(B)G-9
R717	(B)G-9
R719	(B)E-8
R720	(B)E-8
R721	(B)E-8
R722	(B)F-9
R723	(B)F-9
R724	(B)E-9
R725	(B)E-6
R726	(B)G-7
R727	(B)G-7
R728	(B)G-7
R729	(B)G-6
R730	(B)F-7
R732	(A)F-6
R733	(A)F-6
R734	(A)F-6
R735	(A)F-6
R737	(B)F-9
R740	(A)G-5
R741	(A)G-5
R742	(A)G-5
R743	(A)G-5
R744	(A)G-5
R745	(A)G-5
R751	(A)E-9
R756	(B)E-8
R757	(A)E-8
R758	(B)G-9
R759	(B)G-9
R775	(A)E-8
S301	(A)G-1
S302	(A)G-3
S303	(A)G-6
S304	(A)G-9
S305	(A)G-5
S306	(A)G-8
S307	(A)G-4
X400	(A)C-8
X701	(B)G-6
X702	(B)G-8

VC-167P (MAIN) PRINTED WIRING BOARD

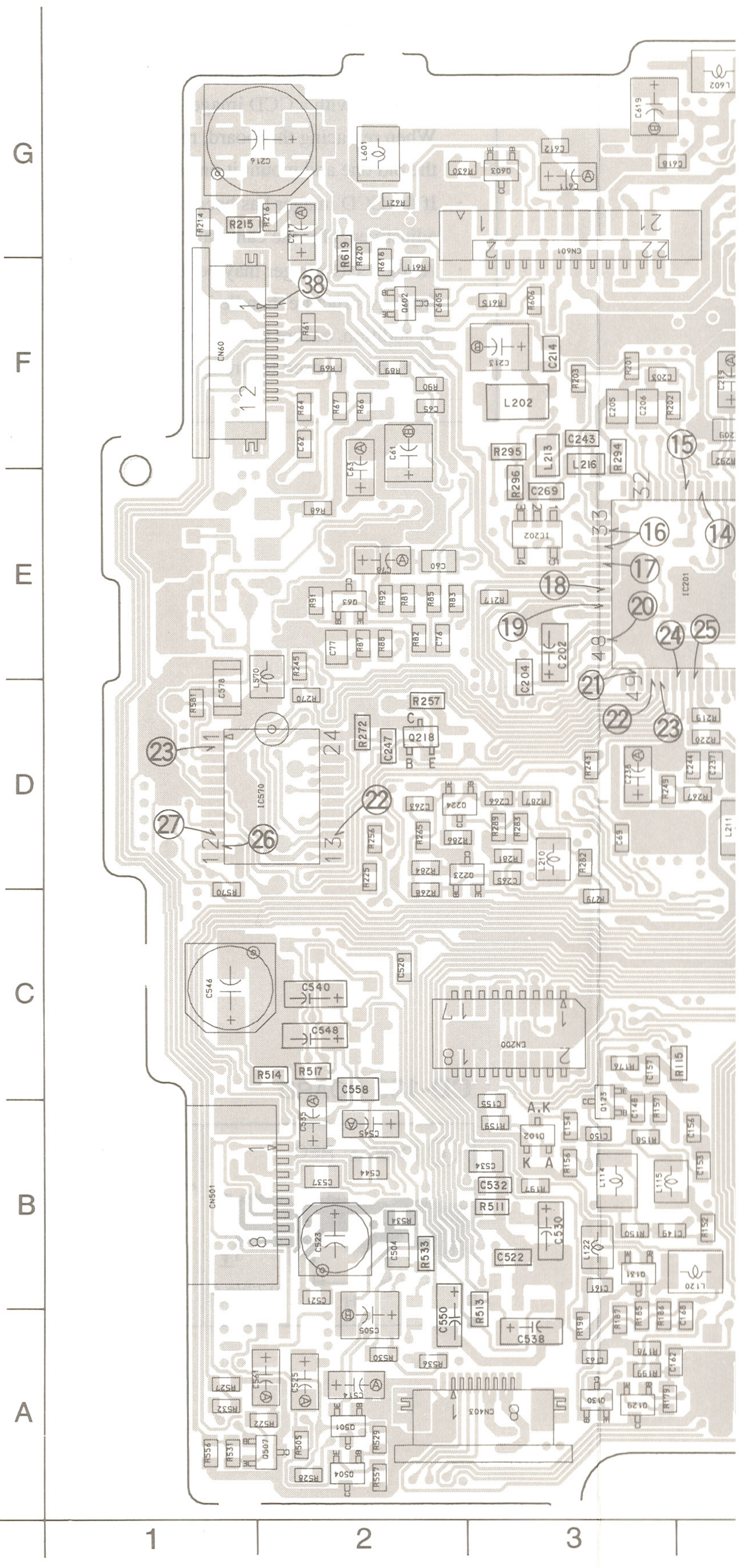
— Ref. No. VC-167P Board; 1,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

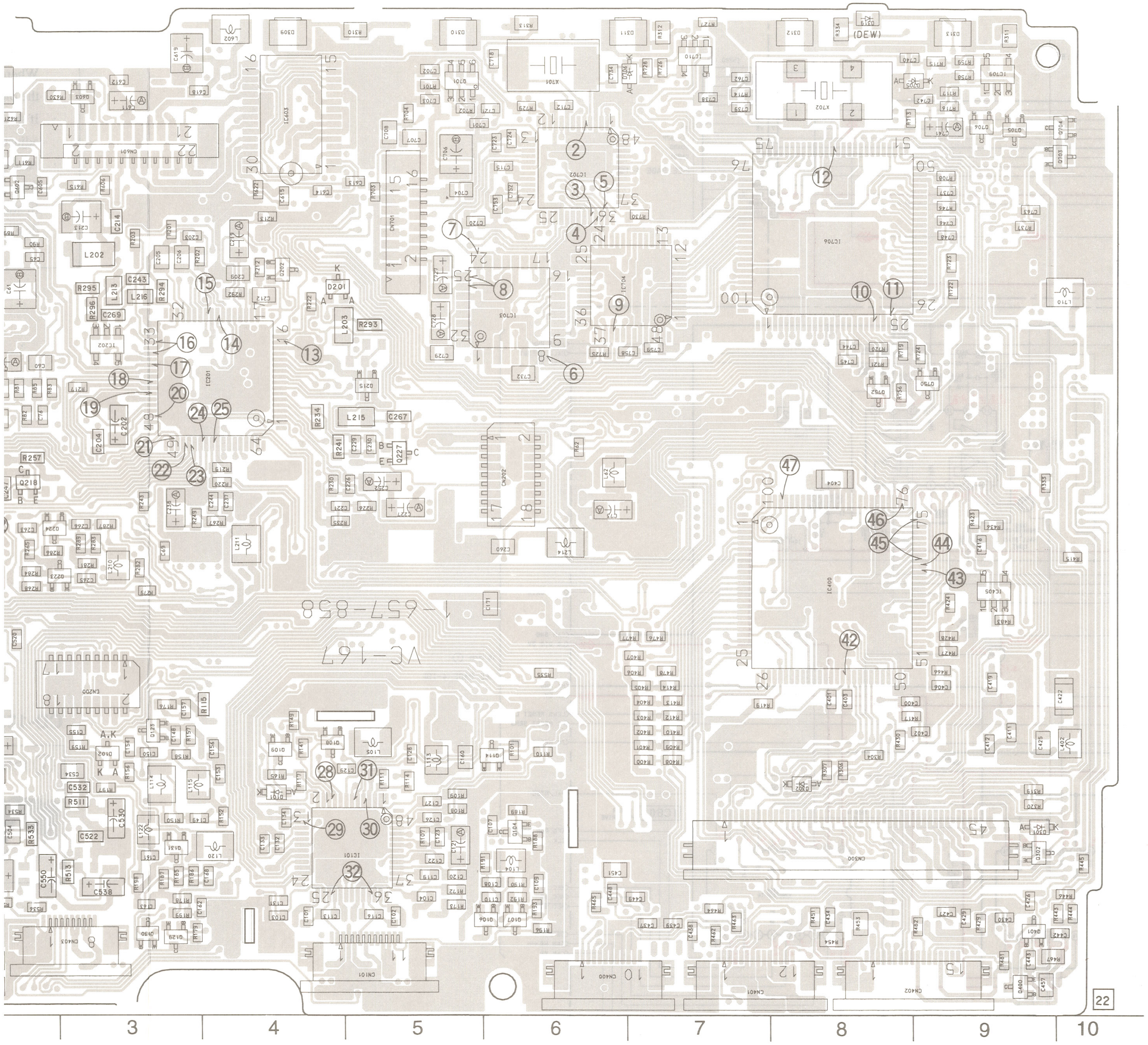
VC-167P BOARD (SIDE A)

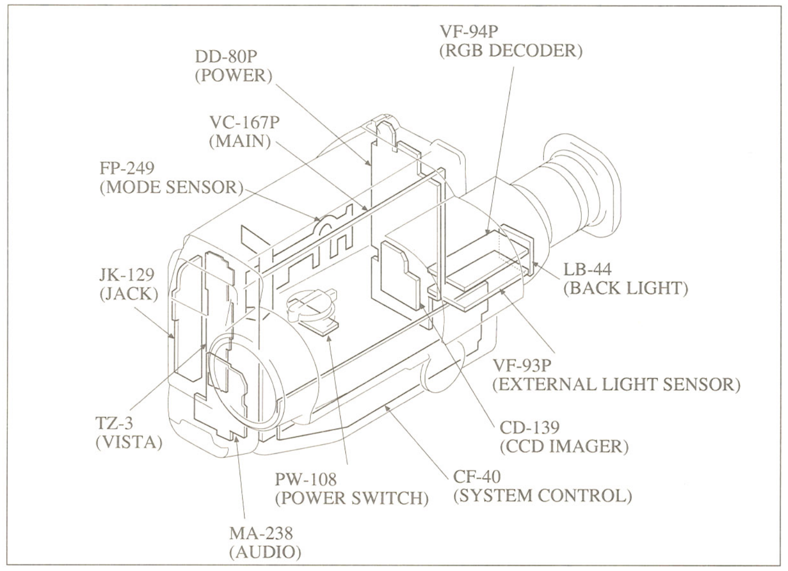

PAUSE
FF
PLAY
REW
STOP
EDIT SEARCH
−
+
S304
S306
S303
S305
S307
S302
S301
IC707
IC705
IC701
IC708
IC604
IC601
IC602
IC60
IC401
IC402
IC403
IC404
IC501
X400
VC-167
1-657-858
G
F
E
D
C
B
A
10
9
8
7
6
5
4
3
2
1
16
22

VC-167P BOARD (SIDE B)


G
F
E
D
C
B
A
1
2
3
L202
R215
R514
R517
C558
C540
C548
R511
C532
C522

(SIDE B)

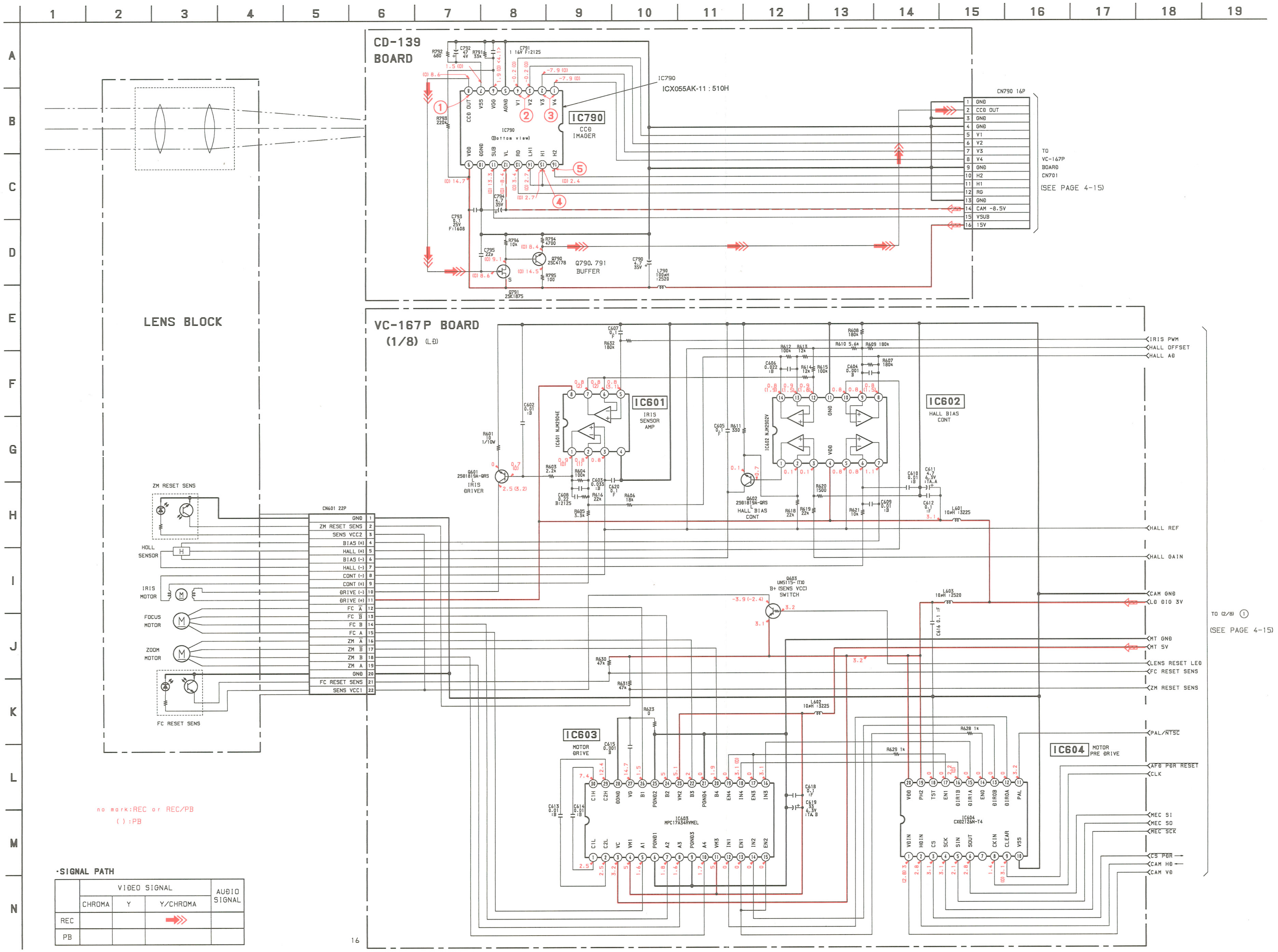

VC-167
1-657-858
IC201
IC702
IC703
IC704
IC706
IC400
IC101
CN300
CN400
CN401
CN402
CN101
CN200
CN401
CN403
CN701
CN702
X701
X702
(DEW)
22
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑭
⑮
⑯
⑰
⑱
⑲
⑳
㉑
㉒
㉓
㉔
㉕
㉘
㉙
㉚
㉛
㉜
㊷
㊸
㊹
㊺
㊻
㊼
3
4
5
6
7
8
9
10


VF-94P
(RGB DECODER)
DD-80P
(POWER)
VC-167P
(MAIN)
FP-249
(MODE SENSOR)
JK-129
(JACK)
LB-44
(BACK LIGHT)
VF-93P
(EXTERNAL LIGHT SENSOR)
TZ-3
(VISTA)
CD-139
(CCD IMAGER)
CF-40
(SYSTEM CONTROL)
PW-108
(POWER SWITCH)
MA-238
(AUDIO)

VC-167P (CAMERA 1) , CD-139 (CCD IMAGER) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAMS

• See page 4-7 for VC-167P BOARD printed wiring board.

— Ref. No. VC-167P Board; 1,000 Series, CD-139 Board; 2,000 Series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
A
B
C
D
E
F
G
H
I
J
K
L
M
N
CD-139 BOARD
IC790
ICX055AK-11 : 510H
IC790
CCD IMAGER
IC790 (Bottom view)
CCD OUT
VSS
VDD
AGND
V1
V2
V3
V4
VDD
GGND
SUB
VL
RG
LH1
H1
H2
①
②
③
④
⑤
Q790, 791
BUFFER
Q790
2SC4178
Q791
2SK1875
CN790 16P
1 GND
2 CCD OUT
3 GND
4 GND
5 V1
6 V2
7 V3
8 V4
9 GND
10 H2
11 H1
12 RG
13 GND
14 CAM -8.5V
15 VSUB
16 15V
TO
VC-167P
BOARD
CN701
(SEE PAGE 4-15)
LENS BLOCK
ZM RESET SENS
HOLL SENSOR
IRIS MOTOR
FOCUS MOTOR
ZOOM MOTOR
FC RESET SENS
CN601 22P
GND 1
ZM RESET SENS 2
SENS VCC2 3
BIAS (+) 4
HALL (+) 5
BIAS (-) 6
HALL (-) 7
CONT (-) 8
CONT (+) 9
DRIVE (-) 10
DRIVE (+) 11
FC $\overline{A}$ 12
FC $\overline{B}$ 13
FC B 14
FC A 15
ZM $\overline{A}$ 16
ZM $\overline{B}$ 17
ZM B 18
ZM A 19
GND 20
FC RESET SENS 21
SENS VCC1 22
VC-167P BOARD
(1/8) (LD)
IC601
IRIS SENSOR AMP
IC601 NJM2904E
Q601
2SD1819A-QRS
IRIS DRIVER
IC602
HALL BIAS CONT
IC602 NJM2902V
Q602
2SD1819A-QRS
HALL BIAS CONT
Q603
UN5115-(TX)
B+ (SENS VCC) SWITCH
IC603
MOTOR DRIVE
IC603
MPC17A34VMEL
IC604
MOTOR PRE DRIVE
IC604
CXD2126N-T4
IRIS PWM
HALL OFFSET
HALL AD
HALL REF
HALL GAIN
CAM GND
LD DIG 3V
MT GND
MT 5V
LENS RESET LED
FC RESET SENS
ZM RESET SENS
PAL/$\overline{NTSC}$
$\overline{AFD\ PDR\ RESET}$
CLK
MEC SI
MEC SO
$\overline{MEC\ SCK}$
$\overline{CS\ PDR}$
CAM HD
CAM VD
TO (2/8) ①
(SEE PAGE 4-15)
16

no mark:REC or REC/PB

( ) :PB

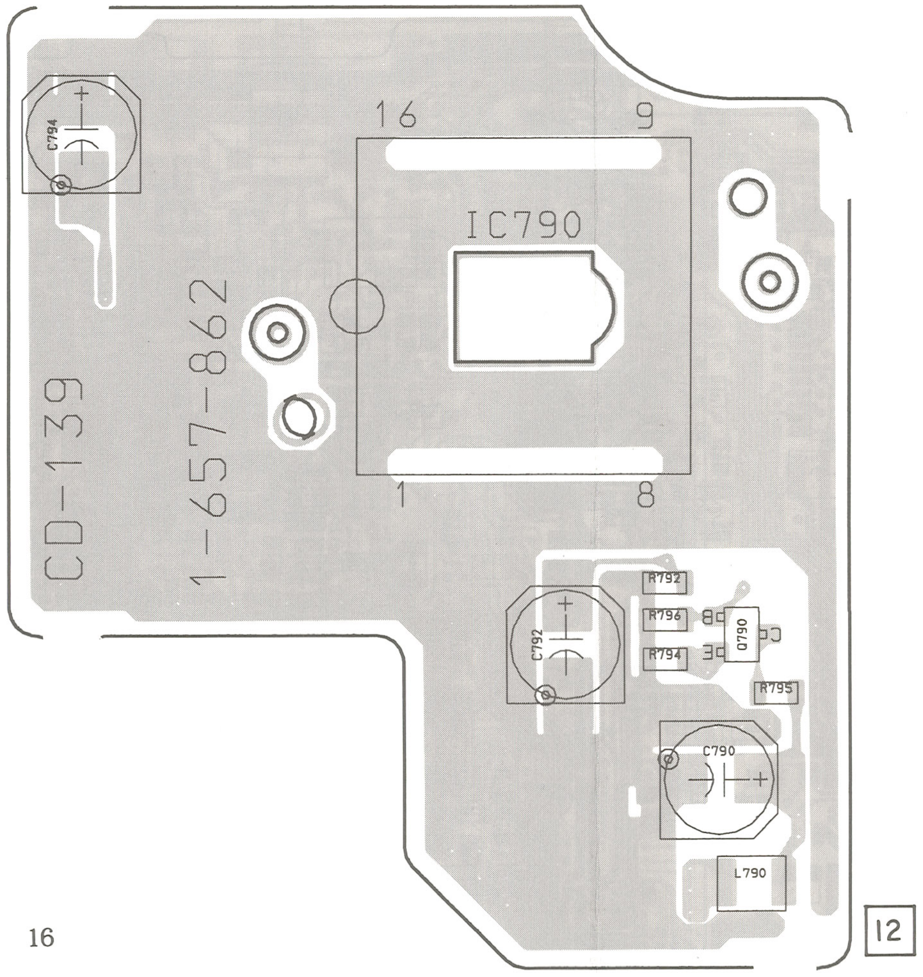
·SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	
PB				

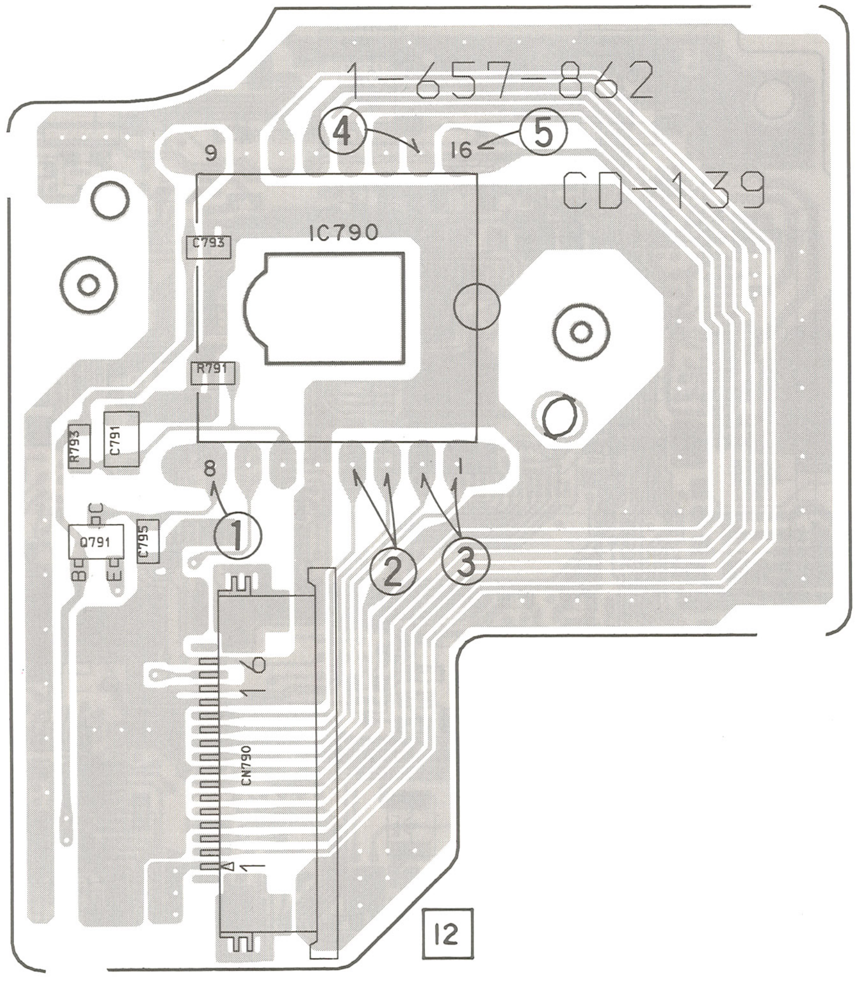
Precautions Upon Replacing CCD Imager

- The CD-139 board mounted as a repair part is not equipped with a CCD imager.
  When replacing this board, remove the CCD imager from the old one and mount it onto the new one.
- If the CCD imager has been replaced, carry out all the adjustments for the camera section.
- As the CCD imager may be damaged by static electricity from its structure, handle it carefully like for the MOS IC.
  In addition, ensure that the receiver is not covered with dusts nor exposed to strong light.

CD-139 BOARD (SIDE A)

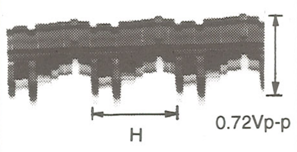

C794
16
9
IC790
CD-139
1-657-862
1
8
R792
R796
R794
Q790
C792
R795
C790
L790
16
12

CD-139 BOARD (SIDE B)

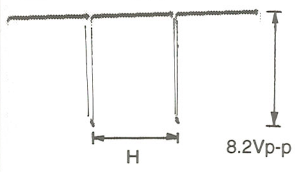

1-657-862
④
⑤
9
16
CD-139
IC790
C793
R791
R793
C791
8
1
Q791
C795
①
②
③
16
CN790
1
12

CD-139 BOARD

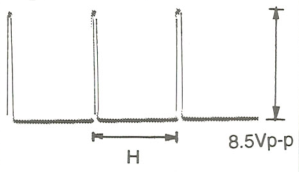
① IC790 ⑧ REC



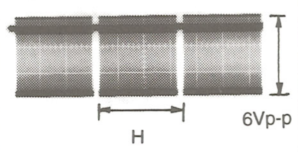
② IC790 ③,④ REC



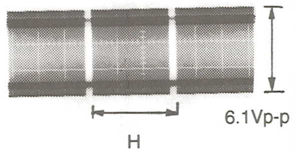
③ IC790 ①,② REC

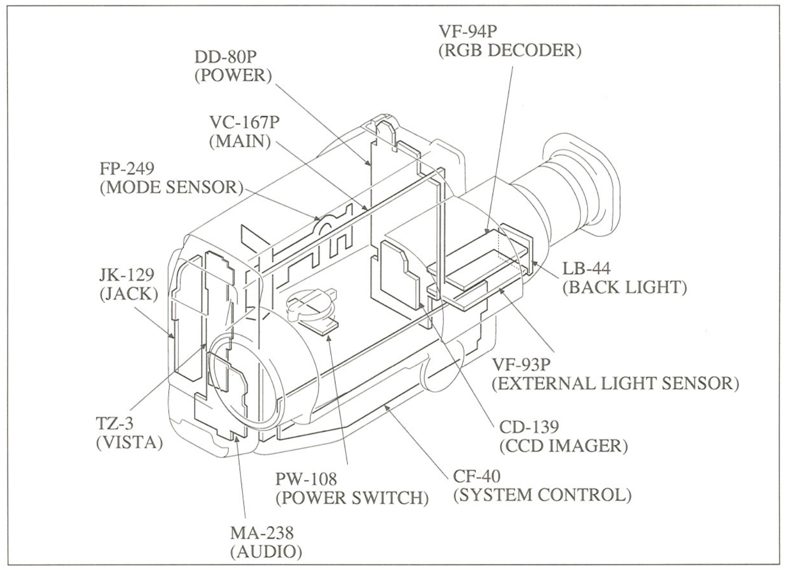


④ IC790 ⑮ REC



⑤ IC790 ⑯ REC




VF-94P
(RGB DECODER)
DD-80P
(POWER)
VC-167P
(MAIN)
FP-249
(MODE SENSOR)
JK-129
(JACK)
LB-44
(BACK LIGHT)
VF-93P
(EXTERNAL LIGHT SENSOR)
TZ-3
(VISTA)
CD-139
(CCD IMAGER)
PW-108
(POWER SWITCH)
CF-40
(SYSTEM CONTROL)
MA-238
(AUDIO)

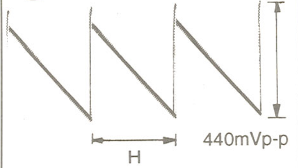
VC-167P (CAMERA 2) SCHEMATIC DIAGRAM

— Ref. No. VC-167P Board; 1,000 Series —

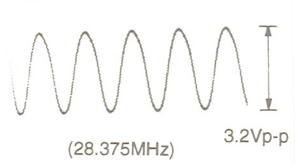
- See page 4-7 for VC-167P BOARD printed wiring board.

VC-167P BOARD

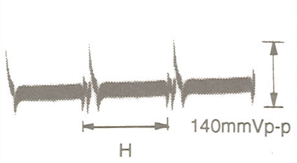
① IC701 ① REC



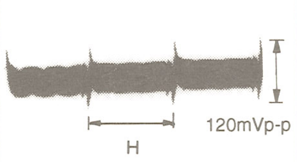
② IC702 ⑤ REC/PB



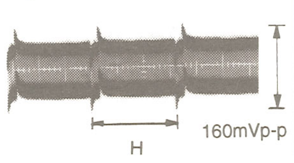
③ IC702 ㉝ REC



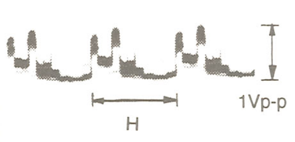
④ IC702 ㉞ REC



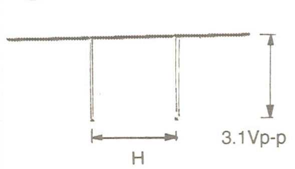
⑤ IC702 ㉟ REC



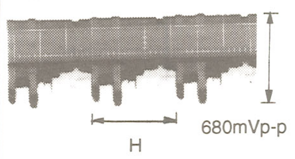
⑥ IC703 ⑧ REC



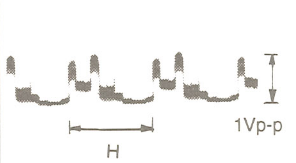
⑦ IC703 ㉔ REC



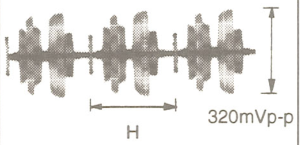
⑧ IC703 ㉕ ,㉖ REC



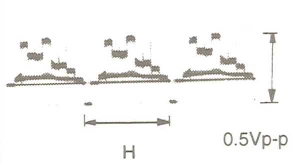
⑨ IC704 ㊴ REC



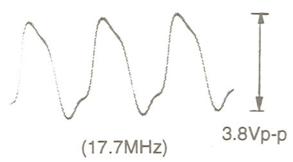
⑩ IC706 ⑳ REC

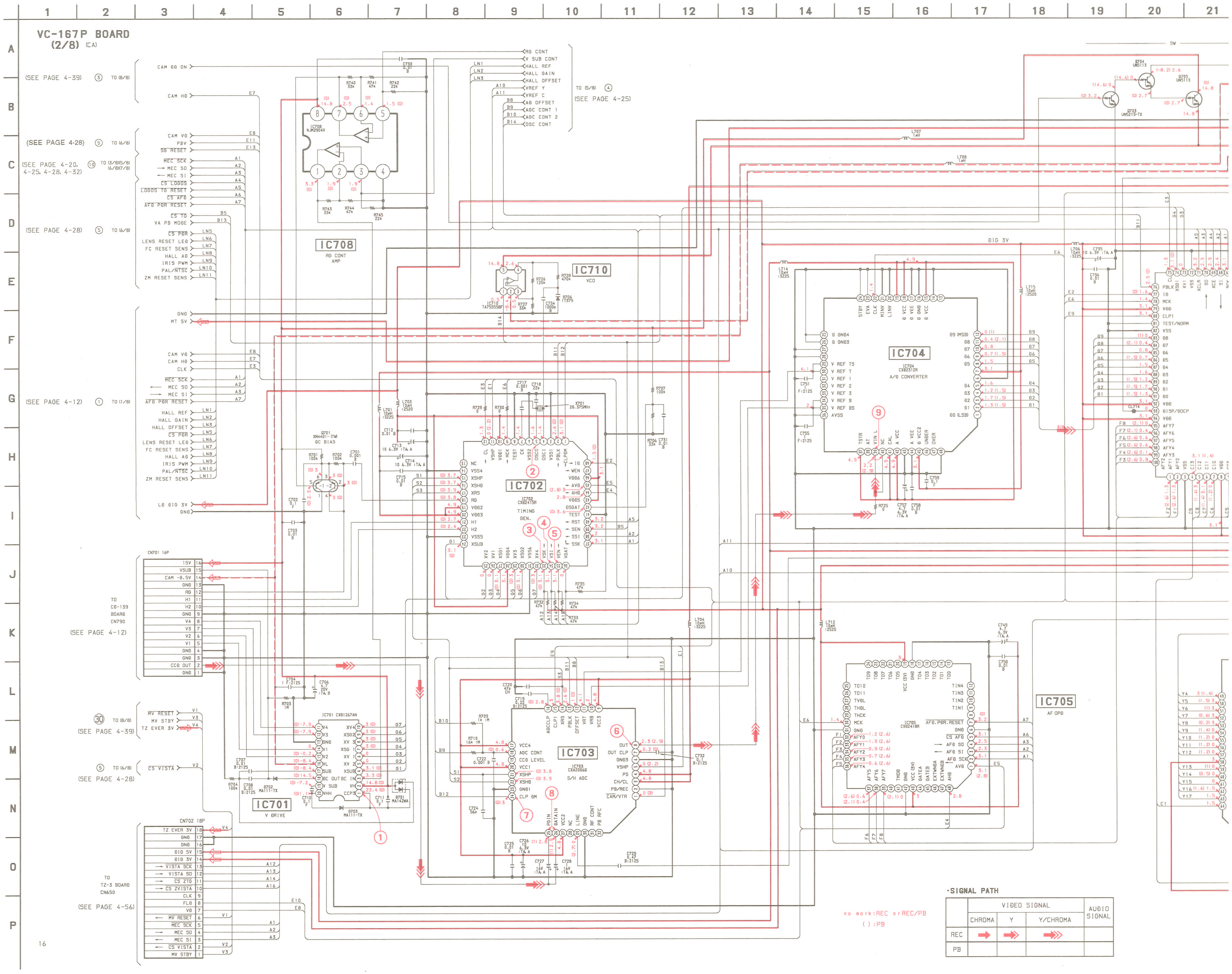


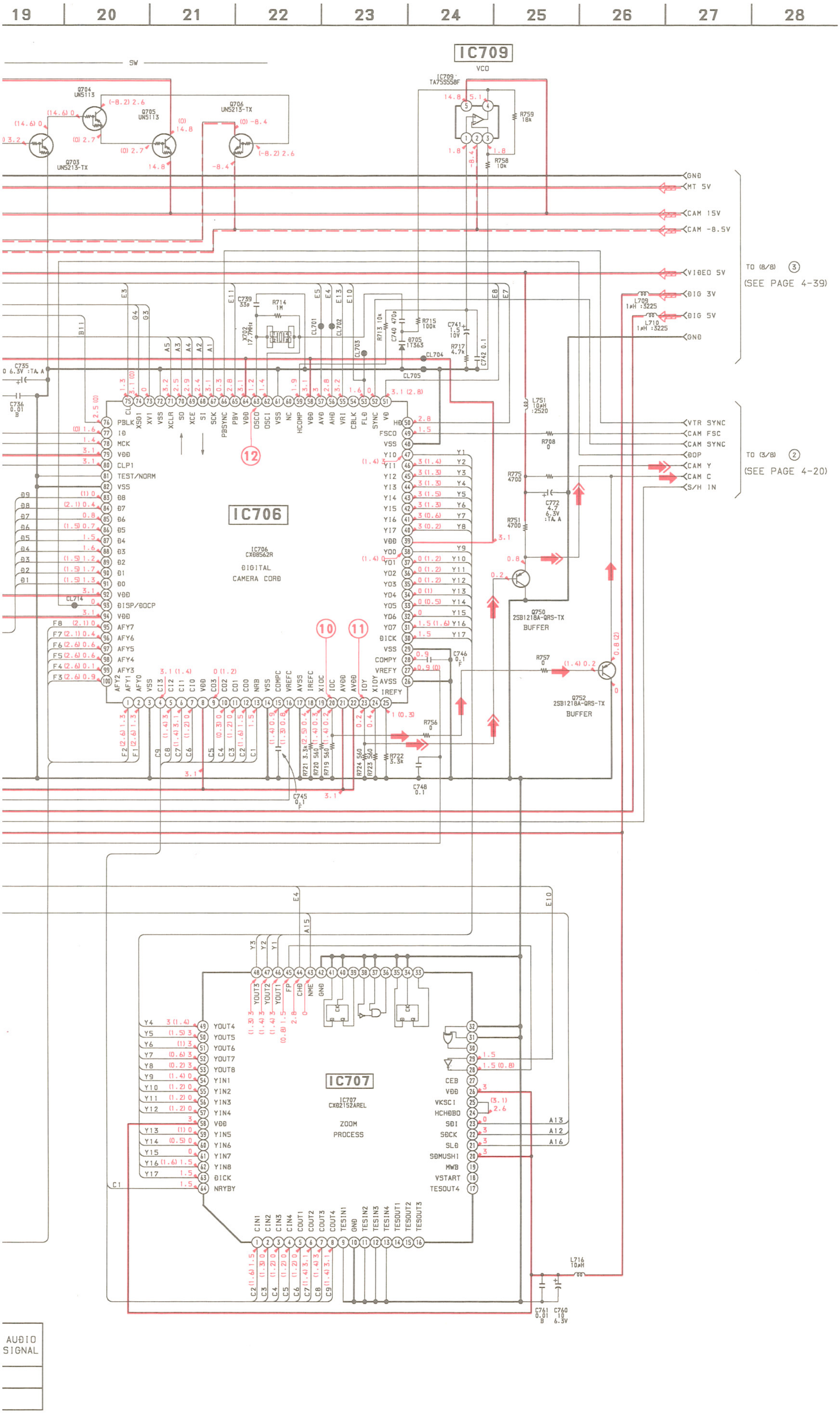
⑪ IC706 ㉓ REC



⑫ IC706 63 REC




VC-167P BOARD
(2/8) (CA)
IC708
RG CONT AMP
IC710
VCO
IC704
A/D CONVERTER
IC702
TIMING GEN.
IC703
S/H AGC
IC701
V DRIVE
IC705
AF DPB
(SEE PAGE 4-39)
(SEE PAGE 4-28)
(SEE PAGE 4-20, 4-25, 4-28, 4-32)
(SEE PAGE 4-12)
(SEE PAGE 4-25)
(SEE PAGE 4-56)
TO CD-139 BOARD CN790
TO TZ-3 BOARD CN650
no mark:REC or REC/PB
( ):PB
・SIGNAL PATH
VIDEO SIGNAL
CHROMA
Y
Y/CHROMA
AUDIO SIGNAL
REC
PB


19
20
21
22
23
24
25
26
27
28
SW
Q704 UN5113
Q705 UN5113
Q703 UN5213-TX
Q706 UN5213-TX
IC709
VCO
IC709 TA75S558F
R759 18k
R758 10k
GND
MT 5V
CAM 15V
CAM -8.5V
VIDEO 5V
DIG 3V
DIG 5V
GND
TO (8/8) ③
(SEE PAGE 4-39)
L709 1μH :3225
L710 1μH :3225
C735 6.3V :TA A
C736 0.01 B
C739 33p
R714 1M
X702 17.7MHz
R713 10k
C740 470p
R715 100k
D705 1T365
C741 1 10V
R717 4.7k
C742 0.1
CL701
CL702
CL703
CL704
CL705
L751 10μH :2520
R708 0
VTR SYNC
CAM FSC
CAM SYNC
BOP
CAM Y
CAM C
S/H IN
TO (3/8) ②
(SEE PAGE 4-20)
R775 4700
C772 4.7 6.3V :TA A
R751 4700
IC706
IC706 CXD8562R
DIGITAL CAMERA CORD
12
10
11
PBLK
ID
MCK
VDD
CLP1
TEST/NORM
VSS
D8
D7
D6
D5
D4
D3
D2
D1
D0
VDD
DISP/BOCP
VDD
AFY7
AFY6
AFY5
AFY4
AFY3
CL714
Q750 2SB1218A-QRS-TX BUFFER
Q752 2SB1218A-QRS-TX BUFFER
R757 0
C746 0.1 F
R756 0
R722 3.3k
C748 0.1
C745 0.1 F
R721 3.3k
R720 560
R719 560
R724 560
R723 560
IC707
IC707 CXD2152AREL
ZOOM PROCESS
YOUT4
YOUT5
YOUT6
YOUT7
YOUT8
YIN1
YIN2
YIN3
YIN4
VDD
YIN5
YIN6
YIN7
YIN8
DICK
NRYBY
CEB
VDD
VKSCI
HCHDBO
SDI
SDCK
SLD
SDMUSH1
MWB
VSTART
TESOUT4
A13
A12
A16
L716 10μH
C761 0.01 B
C760 10 6.3V
AUDIO SIGNAL

CAMERA 2
VC-167P(2/8)

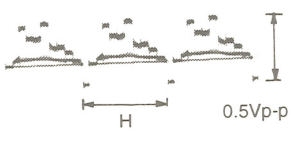
VC-167P (CAMERA 3) SCHEMATIC DIAGRAM

— Ref. No. VC-167P Board; 1,000 Series —

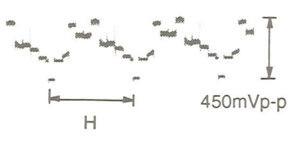
• See page 4-7 for VC-167P BOARD printed wiring board.

VC-167P BOARD

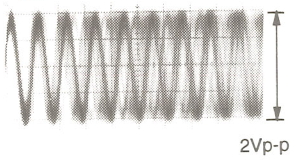
⑬ IC201 ⑮ REC



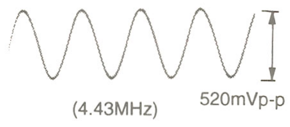
⑯ IC201 ㉞ ,㊱ REC



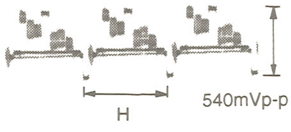
⑳ IC201 ㊼ PB



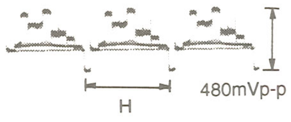
㉔ IC201 (54) REC/PB



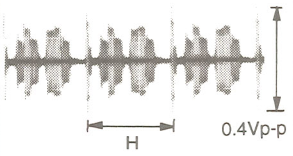
⑬ IC201 ⑮ PB



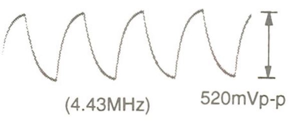
⑯ IC201 ㉞ ,㊱ PB



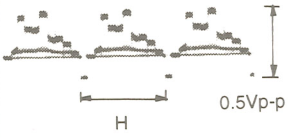
㉑ IC201 ㊾ REC



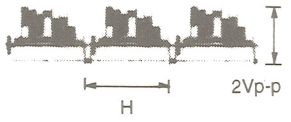
㉕ IC201 (56) REC/PB



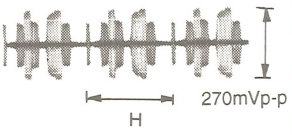
⑭ IC201 ㉔ REC



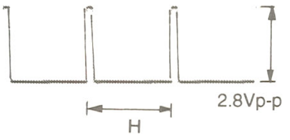
⑰ IC201 ㊳ REC



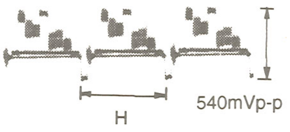
㉒ IC201 (51) REC



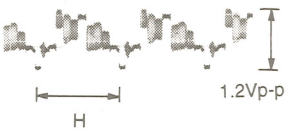
㉖ IC570 ⑪ REC/PB



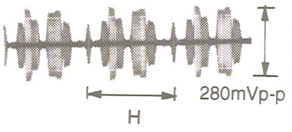
⑭ IC201 ㉔ PB



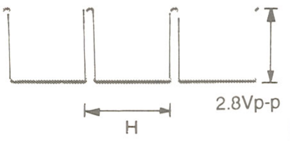
⑰ IC201 ㊳ PB



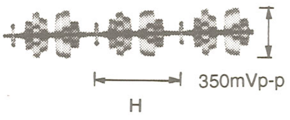
㉒ IC201 (51) PB
IC570 ⑮ PB



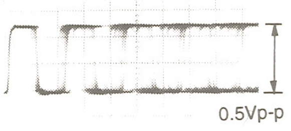
㉗ IC570 ⑩ PB



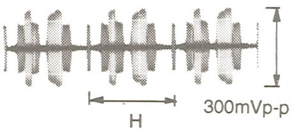
⑮ IC201 ㉖ REC



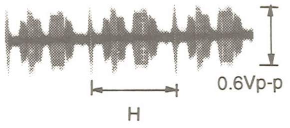
⑱ IC201 ㊶ REC



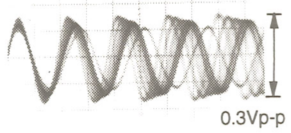
㉓ IC201 (52) REC



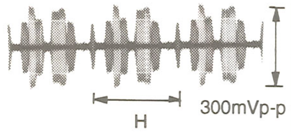
⑮ IC201 ㉖ PB



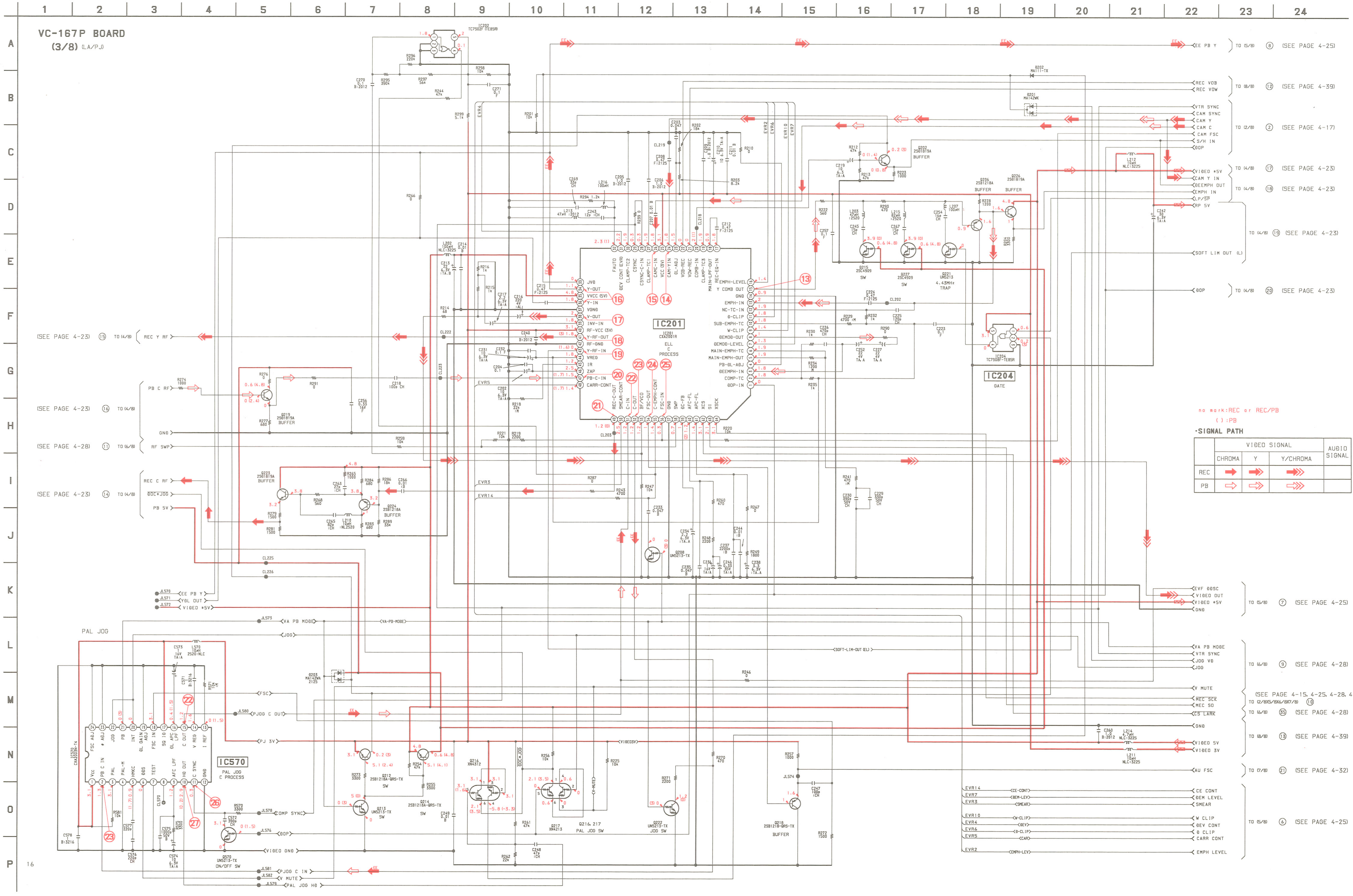
⑲ IC201 ㊸ PB



㉓ IC201 (52) PB
IC570 ② PB



VC-167P BOARD
(3/8) (LA/PJ)


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
A B C D E F G H I J K L M N O P
IC201
CXA2001R
ELL
C
PROCESS
IC204
GATE
IC204
TC7S08F-TE85R
IC202
TC7S02F (TE85R)
IC570
PAL JOG
C PROCESS
IC570
CXA1005N-T4
PAL JOG
Q219 2SB1219A BUFFER
Q223 2SB1219A BUFFER
Q224 2SB1218A BUFFER
Q225 2SC4909 SW
Q227 2SC4909 SW
Q221 UN5213 4.43MHz TRAP
Q226 2SB1219A BUFFER
Q229 2SB1218A BUFFER
Q202 2SB1219A BUFFER
Q212 2SB1218A-QRS-TX SW
Q213 UN5215-TX SW
Q214 2SB1218A-QRS-TX SW
Q216, 217 PAL JOG SW
Q222 UN5213-TX JOG SW
Q218 2SB1218-QRS-TX BUFFER
Q570 UN5213-TX ON/OFF SW
(SEE PAGE 4-23) ⑮ TO (4/8) REC Y RF
PB C RF
GND
(SEE PAGE 4-23) ⑯ TO (4/8)
(SEE PAGE 4-28) ⑪ TO (6/8) RF SWP
REC C RF
DOC•JOG
PB 5V
(SEE PAGE 4-23) ⑭ TO (4/8)
EE PB Y
YBL OUT
VIDEO *5V
VA PB MODE
JOG
FSC
PJOG C OUT
PJ 3V
COMP SYNC
DOP
VIDEO GND
PJOG C IN
V MUTE
PAL JOG HD
EE PB Y TO (5/8) ⑧ (SEE PAGE 4-25)
REC VDB
REC VDW
TO (8/8) ⑫ (SEE PAGE 4-39)
VTR SYNC
CAM SYNC
CAM Y
CAM C
CAM FSC
S/H IN
DOP
TO (2/8) ② (SEE PAGE 4-17)
VIDEO *5V
CAM Y IN
TO (4/8) ⑰ (SEE PAGE 4-23)
DEEMPH OUT
EMPH IN
LP/SP
TO (4/8) ⑱ (SEE PAGE 4-23)
RP 5V
SOFT LIM OUT (L)
TO (4/8) ⑲ (SEE PAGE 4-23)
DOP
TO (4/8) ⑳ (SEE PAGE 4-23)
EVF DOSC
VIDEO OUT
VIDEO *5V
GND
TO (5/8) ⑦ (SEE PAGE 4-25)
VA PB MODE
VTR SYNC
JOG VD
JOG
TO (6/8) ⑨ (SEE PAGE 4-28)
V MUTE
MEC SCK
MEC SO
(SEE PAGE 4-15, 4-25, 4-28, 4-32)
TO (2/8)(5/8)(6/8)(7/8) ⑩
CS LARK
TO (6/8) (35) (SEE PAGE 4-28)
GND
VIDEO 5V
VIDEO 3V
TO (8/8) ⑬ (SEE PAGE 4-39)
AU FSC
TO (7/8) ㉑ (SEE PAGE 4-32)
CE CONT
DEM LEVEL
SMEAR
W CLIP
DEV CONT
D CLIP
CARR CONT
EMPH LEVEL
TO (5/8) ⑥ (SEE PAGE 4-25)

no mark:REC or REC/PB
( ):PB

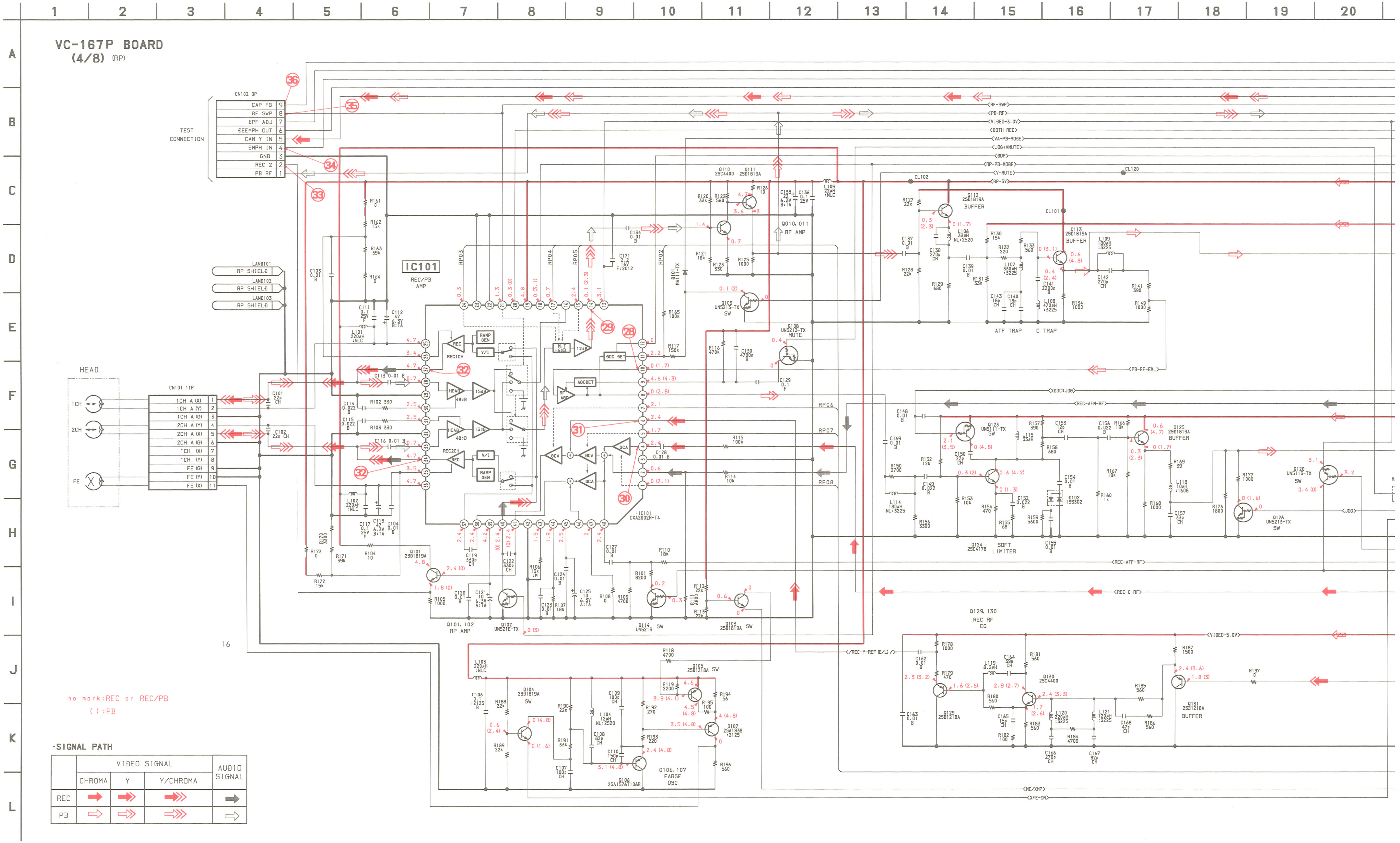
·SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡⋙	
PB	⇨	⇨»	⇨⋙	

VC-167P (VIDEO 1) SCHEMATIC DIAGRAM

— Ref. No. VC-167P Board; 1,000 Series —

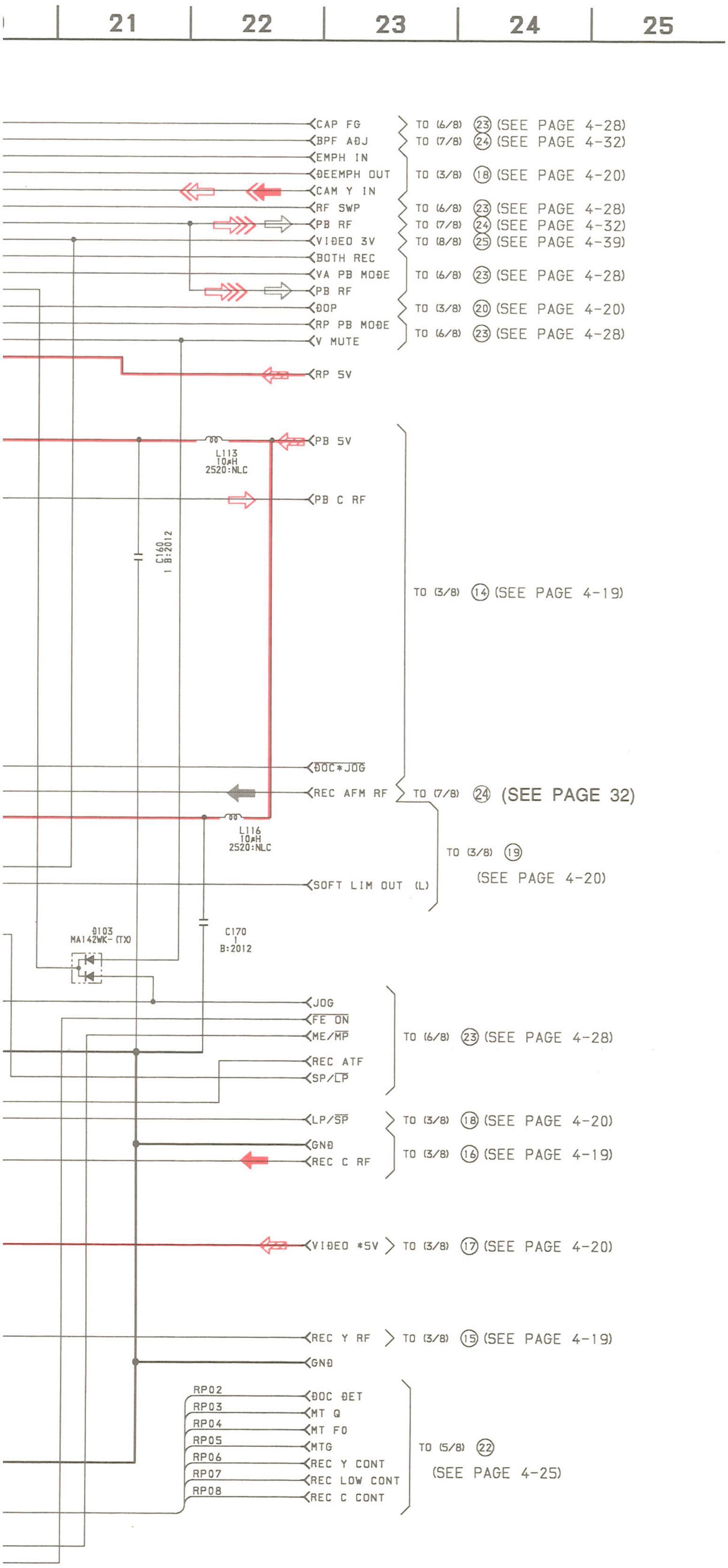
• See page 4-7 for VC-167P BOARD printed wiring board.


VC-167P BOARD
(4/8) (RP)
CN102 9P
CAP FG
RF SWP
BPF ADJ
DEEMPH OUT
CAM Y IN
EMPH IN
GND
REC 2
PB RF
TEST CONNECTION
LANB101 RP SHIELD
LANB102 RP SHIELD
LANB103 RP SHIELD
HEAD
1CH
2CH
FE
CN101 11P
IC101
REC/PB AMP
IC101 CXA2002R-T4
REC1CH
REC2CH
RAMP GEN
V/I
AGC DET
DOC DET
RF AGC
GCA
Q110, Q111 RF AMP
Q109 UN5213-TX SW
Q108 UN5213-TX MUTE
Q101, 102 RP AMP
Q102 UN5214-TX
Q114 UN5213 SW
Q103 2SB1819A SW
Q112 2SB1819A BUFFER
Q113 2SB1819A BUFFER
ATF TRAP
C TRAP
Q123 UN5111-TX SW
Q124 2SC4178 SOFT LIMITER
Q125 2SB1819A BUFFER
Q120 UN5113-TX SW
Q126 UN5213-TX SW
Q129, 130 REC RF EQ
Q131 2SB1218A BUFFER
Q104 2SB1819A SW
Q105 2SB1218A SW
Q106, 107 ERASE OSC
RF-SWP
PB-RF
VIDEO-3.0V
BOTH-REC
VA-PB-MODE
JOG+VMUTE
DOP
RP-PB-MODE
Y-MUTE
RP-5V
PB-RF-EQL
XDOC+JOG
REC-AFM-RF
REC-ATF-RF
REC-C-RF
VIDEO-5.0V
REC-Y-REF E/L
JOG
ME/XMP
XFE-ON
RP06
RP07
RP08

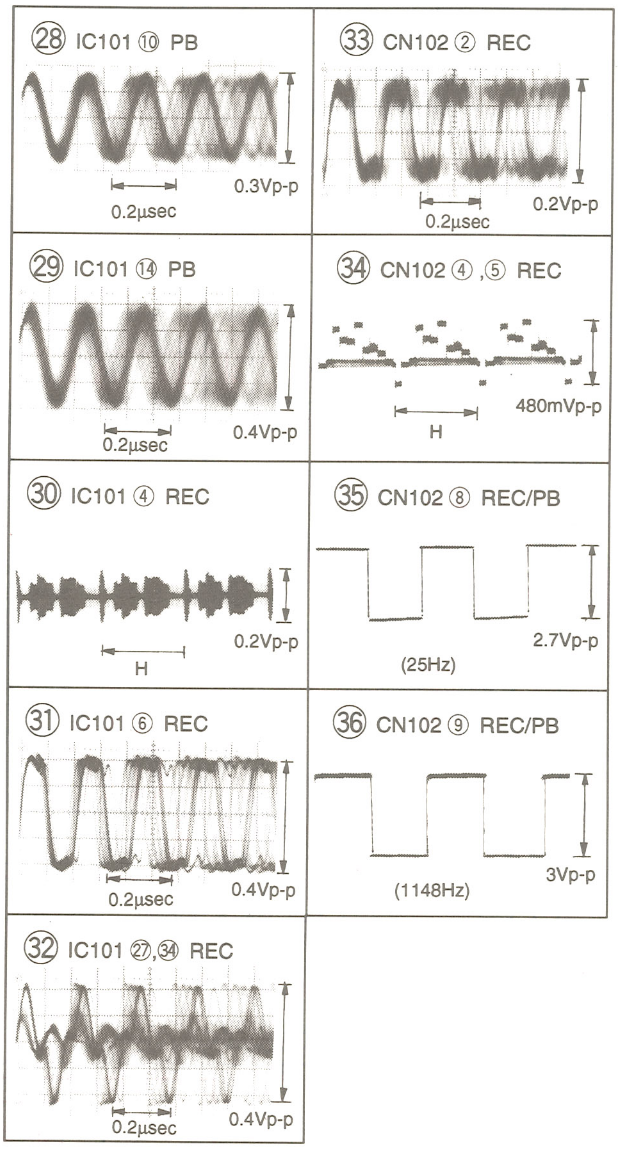
no mark:REC or REC/PB
( ):PB

·SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡➡	➡➡➡	➡
PB	⇨	⇨⇨	⇨⇨⇨	⇨


21
22
23
24
25
CAP FG
BPF ADJ
EMPH IN
DEEMPH OUT
CAM Y IN
RF SWP
PB RF
VIDEO 3V
BOTH REC
VA PB MODE
PB RF
DOP
RP PB MODE
V MUTE
TO (6/8) ㉓ (SEE PAGE 4-28)
TO (7/8) ㉔ (SEE PAGE 4-32)
TO (3/8) ⑱ (SEE PAGE 4-20)
TO (6/8) ㉓ (SEE PAGE 4-28)
TO (7/8) ㉔ (SEE PAGE 4-32)
TO (8/8) ㉕ (SEE PAGE 4-39)
TO (6/8) ㉓ (SEE PAGE 4-28)
TO (3/8) ⑳ (SEE PAGE 4-20)
TO (6/8) ㉓ (SEE PAGE 4-28)
RP 5V
PB 5V
L113
10μH
2520:NLC
PB C RF
C160
1 B:2012
TO (3/8) ⑭ (SEE PAGE 4-19)
DOC*JOG
REC AFM RF
TO (7/8) ㉔ (SEE PAGE 32)
L116
10μH
2520:NLC
TO (3/8) ⑲
(SEE PAGE 4-20)
SOFT LIM OUT (L)
D103
MA142WK-(TX)
C170
1
B:2012
JOG
FE ON
ME/MP
REC ATF
SP/LP
TO (6/8) ㉓ (SEE PAGE 4-28)
LP/SP
TO (3/8) ⑱ (SEE PAGE 4-20)
GND
REC C RF
TO (3/8) ⑯ (SEE PAGE 4-19)
VIDEO *5V
TO (3/8) ⑰ (SEE PAGE 4-20)
REC Y RF
TO (3/8) ⑮ (SEE PAGE 4-19)
GND
RP02
RP03
RP04
RP05
RP06
RP07
RP08
DOC DET
MT Q
MT FO
MTG
REC Y CONT
REC LOW CONT
REC C CONT
TO (5/8) ㉒
(SEE PAGE 4-25)

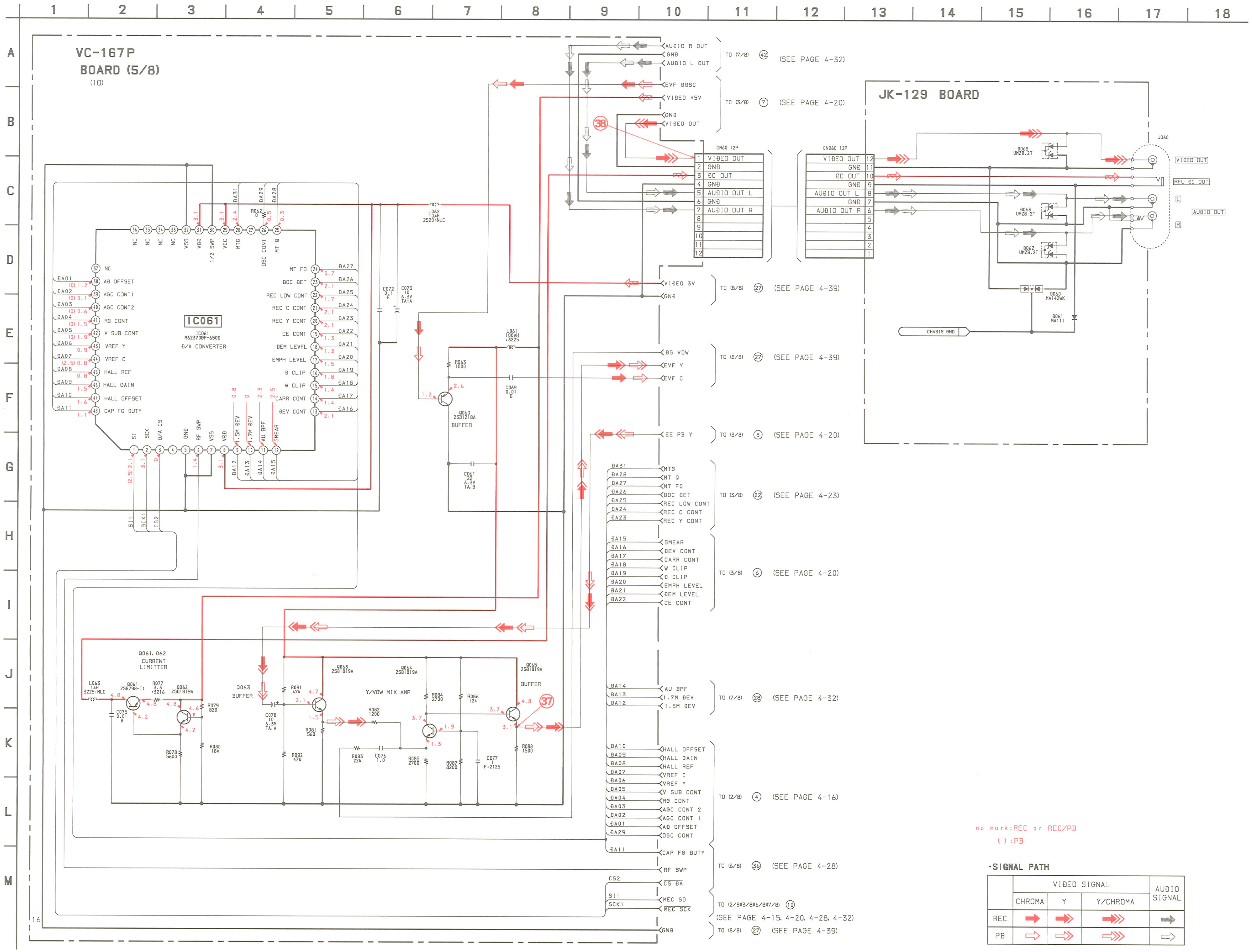
VC-167P BOARD



VC-167P (VIDEO 2) , JK-129 (JACK) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAMS

— Ref. No. VC-167P Board; 1,000 Series, JK-129 Board; 2,000 Series —

• See page 4-7 for VC-167P BOARD printed wiring board.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
A
B
C
D
E
F
G
H
I
J
K
L
M
VC-167P
BOARD (5/8)
(10)
AUDIO R OUT
GND
AUDIO L OUT
TO (7/8) ㊷ (SEE PAGE 4-32)
EVF DDSC
VIDEO *5V
GND
VIDEO OUT
TO (3/8) ⑦ (SEE PAGE 4-20)
38
CN60 12P
1 VIDEO OUT
2 GND
3 DC OUT
4 GND
5 AUDIO OUT L
6 GND
7 AUDIO OUT R
8
9
10
11
12
CN060 12P
VIDEO OUT 12
GND 11
DC OUT 10
GND 9
AUDIO OUT L 8
GND 7
AUDIO OUT R 6
5
4
3
2
1
JK-129 BOARD
J060
D069 UMZ8.2T
D063 UMZ8.2T
D062 UMZ8.2T
D060 MA142WK
D061 MA111
CHASIS GND
VIDEO OUT
RFU DC OUT
L
R
AUDIO OUT
VIDEO 3V
GND
TO (8/8) ㉗ (SEE PAGE 4-39)
DS VDW
EVF Y
EVF C
TO (8/8) ㉗ (SEE PAGE 4-39)
EE PB Y
TO (3/8) ⑧ (SEE PAGE 4-20)
DA31 MTG
DA28 MT Q
DA27 MT FO
DA26 DOC DET
DA25 REC LOW CONT
DA24 REC C CONT
DA23 REC Y CONT
TO (3/8) ㉒ (SEE PAGE 4-23)
DA15 SMEAR
DA16 DEV CONT
DA17 CARR CONT
DA18 W CLIP
DA19 D CLIP
DA20 EMPH LEVEL
DA21 DEM LEVEL
DA22 CE CONT
TO (3/8) ⑥ (SEE PAGE 4-20)
DA14 AU BPF
DA13 1.7M DEV
DA12 1.5M DEV
TO (7/8) ㉘ (SEE PAGE 4-32)
DA10 HALL OFFSET
DA09 HALL GAIN
DA08 HALL REF
DA07 VREF C
DA06 VREF Y
DA05 V SUB CONT
DA04 RG CONT
DA03 AGC CONT 2
DA02 AGC CONT 1
DA01 AD OFFSET
DA29 OSC CONT
TO (2/8) ④ (SEE PAGE 4-16)
DA11 CAP FG DUTY
RF SWP
CS2 CS DA
TO (6/8) ㊱ (SEE PAGE 4-28)
SI1 MEC SO
SCK1 MEC SCK
TO (2/8)(3/8)(6/8)(7/8) ⑩
(SEE PAGE 4-15, 4-20, 4-28, 4-32)
GND
TO (8/8) ㉗ (SEE PAGE 4-39)
IC061
IC061 M62370GP-650D
D/A CONVERTER
1 SI
2 SCK
3 D/A CS
4
5 GND
6 RF SWP
7 VSS
8 VDD
9 1.5M DEV
10 1.7M DEV
11 AU BPF
12 SMEAR
13 DEV CONT
14 CARR CONT
15 W CLIP
16 D CLIP
17 EMPH LEVEL
18 DEM LEVFL
19 CE CONT
20 REC Y CONT
21 REC C CONT
22 REC LOW CONT
23 DOC DET
24 MT FO
25 MT Q
26 OSC CONT
27
28 MTG
29 VCC
30 1/2 SWP
31 VDD
32 VSS
33 NC
34 NC
35 NC
36 NC
37 NC
38 AD OFFSET
39 AGC CONT1
40 AGC CONT2
41 RG CONT
42 V SUB CONT
43 VREF Y
44 VREF C
45 HALL REF
46 HALL GAIN
47 HALL OFFSET
48 CAP FG DUTY
(0) 1.2
(0) 0.1
(0) 0.6
(0) 1.5
(0) 1.9
0.9
(2.5) 0.8
0.8
1.5
1.6
1.1
0.7
2.1
1.7
2.1
2.1
1.3
1.3
1.5
1.8
1.4
1.4
2.1
0.8
0
2.3
2.5
(2.5) 2.1
3.1
0
1.4
3.1
3.1
3.1
2.4
0.5
0.3
R062 0
SI1
SCK1
CS2
C072 0.1 F
C073 10 6.3V TA:A
L062 10μH 2520:NLC
L061 100μH :3225
R063 1000
C069 0.01 B
Q060 2SB1218A
BUFFER
1.2
2.6
C061 22 6.3V TA B
Q061, 062
CURRENT LIMITTER
L063 1μH 3225:NLC
Q061 2SB798-T1
R077 3.3 :3216
Q062 2SD1819A
C075 0.01 B
R078 5600
R079 820
R080 18k
4.8
4.8
4.8
4.6
4.2
4.2
Q063
BUFFER
C078 10 6.3V TA A
R091 47k
R092 47k
Q063 2SD1819A
4.7
2.1
1.5
R081 560
Y/VDW MIX AMP
R082 1200
Q064 2SD1819A
R083 22k
C076 1.0
R084 2700
R085 2700
3.7
1.9
1.3
R086 12k
R087 8200
C077 1 F:2125
Q065 2SD1819A
BUFFER
4.8
3.7
3.1
37
R088 1500
16

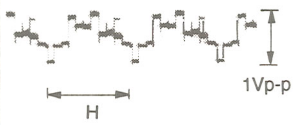
no mark:REC or REC/PB
( ) :PB

·SIGNAL PATH

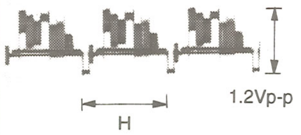
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

VC-167P BOARD

㊲ Q065 Ⓔ REC/PB



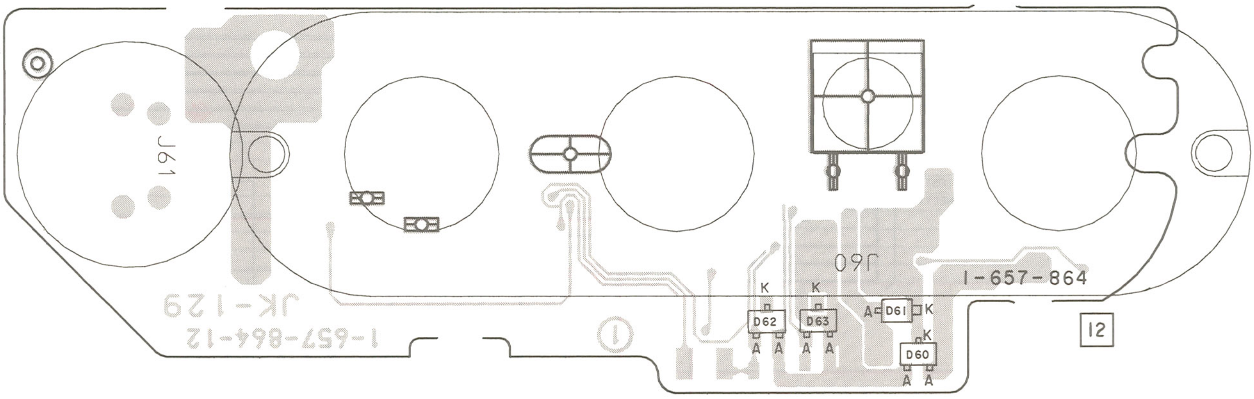
㊳ CN060 ① REC/PB



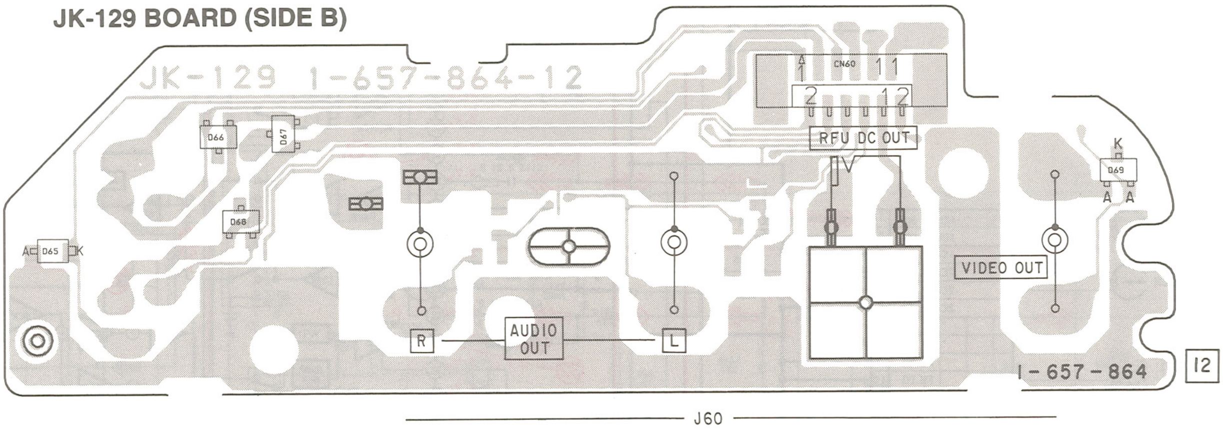
VIDEO 2
VC-167P(5/8)/JK-129

There are few cases that the part printed on this diagram isn't mounted in this model.

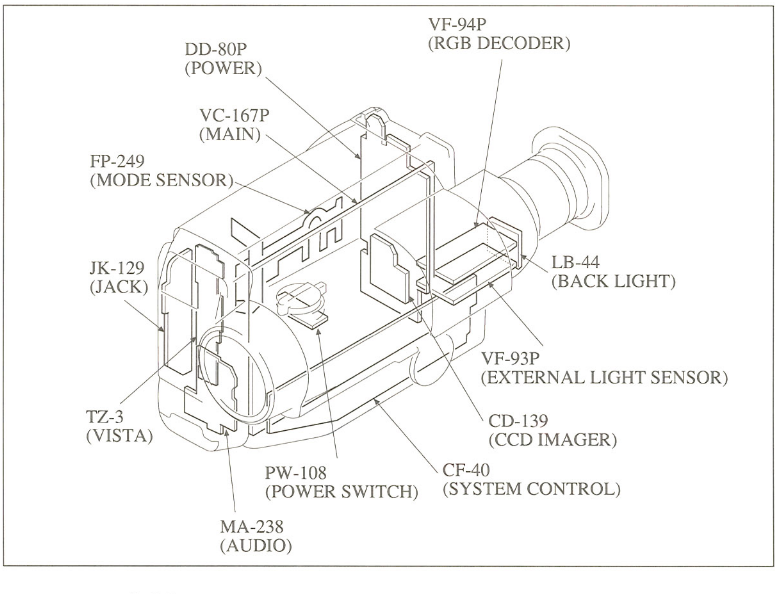
JK-129 BOARD (SIDE A)


J61
JK-129
1-657-864-12
J60
1-657-864
12
D62
D63
D61
D60
K
A

JK-129 BOARD (SIDE B)


JK-129 1-657-864-12
CN60
1
11
2
12
RFU DC OUT
D66
D67
D68
D65
D69
A
K
VIDEO OUT
R
AUDIO OUT
L
1-657-864
12
J60

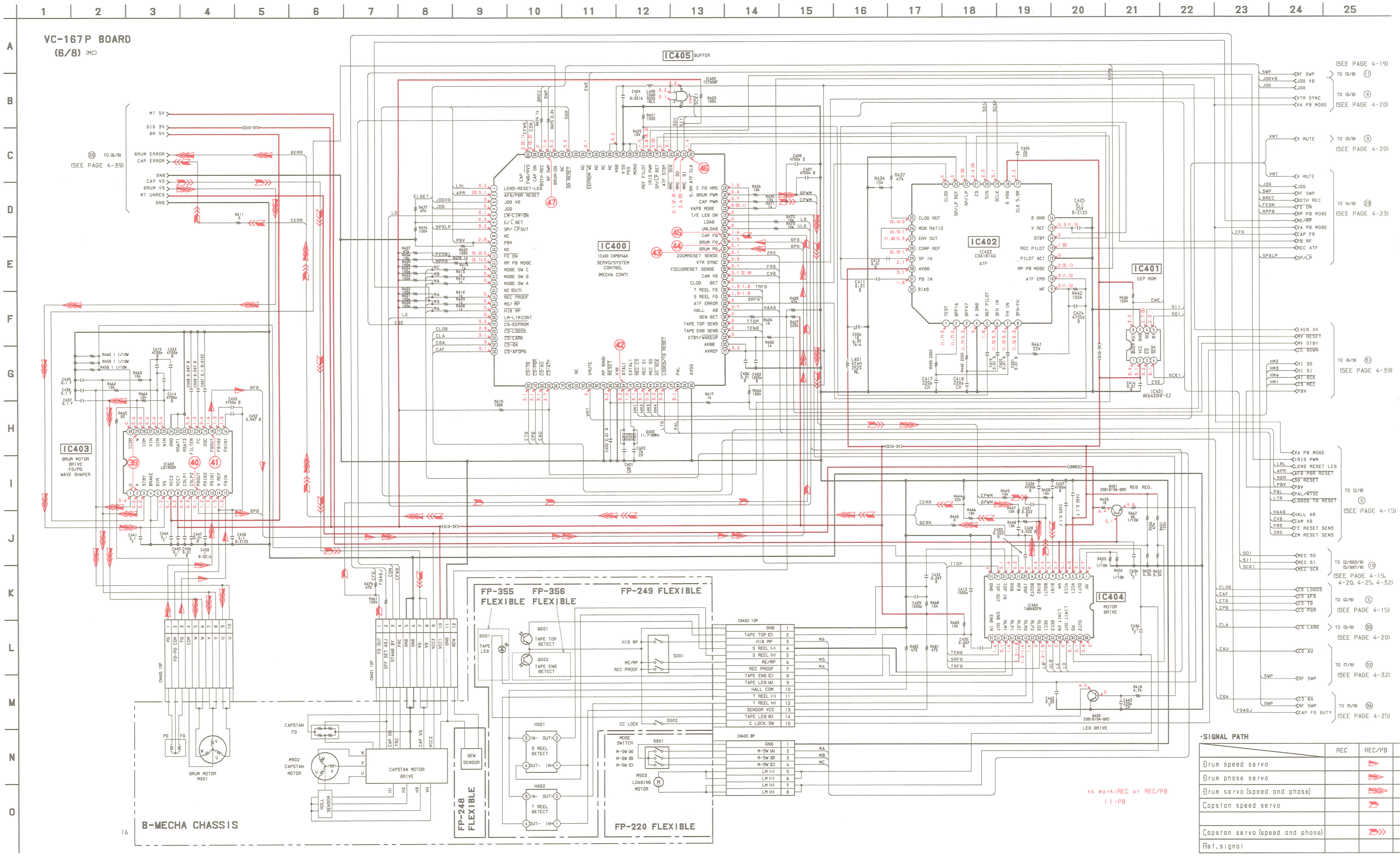
16


VF-94P
(RGB DECODER)
DD-80P
(POWER)
VC-167P
(MAIN)
FP-249
(MODE SENSOR)
LB-44
(BACK LIGHT)
JK-129
(JACK)
VF-93P
(EXTERNAL LIGHT SENSOR)
TZ-3
(VISTA)
CD-139
(CCD IMAGER)
PW-108
(POWER SWITCH)
CF-40
(SYSTEM CONTROL)
MA-238
(AUDIO)

VC-167P (MODE CONTROL), FP-249 (MODE SENSOR) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAMS

• See page 4-7 for VC-167P BOARD printed wiring board.

— Ref. No. VC-167P Board; 1,000 Series, FP-249 Board; 5,000 Series —

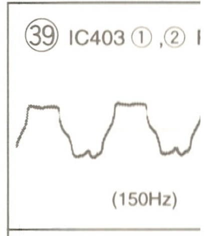


VC-167P BOARD
(6/8) (MC)
IC405 BUFFER
IC400
IC400 CXP87448
SERVO/SYSTEM CONTROL
(MECHA CONT)
IC402
IC402 CXA1814Q
ATF
IC401
EEP ROM
IC401 AK6420HF-E2
IC403
DRUM MOTOR DRIVE
FG/PG WAVE SHAPER
IC403 LB1950V
IC404
MOTOR DRIVE
IC404 TA8482FN
X400 11.718MHz
FP-355 FLEXIBLE
FP-356 FLEXIBLE
FP-249 FLEXIBLE
FP-248 FLEXIBLE
FP-220 FLEXIBLE
B-MECHA CHASSIS
DRUM MOTOR M901
CAPSTAN MOTOR M902
CAPSTAN MOTOR DRIVE
DEW SENSOR
TAPE TOP DETECT
TAPE END DETECT
TAPE LED
S REEL DETECT
T REEL DETECT
MODE SWITCH S901
LOADING MOTOR M903
LED DRIVE
REC PROOF
CC LOCK
CN400 10P
CN401 12P
CN402 15P
CN403 8P
(SEE PAGE 4-19)
(SEE PAGE 4-20)
(SEE PAGE 4-23)
(SEE PAGE 4-39)
(SEE PAGE 4-15)
(SEE PAGE 4-15, 4-20, 4-25, 4-32)
(SEE PAGE 4-32)
(SEE PAGE 4-25)
no mark:REC or REC/PB
( ):PB

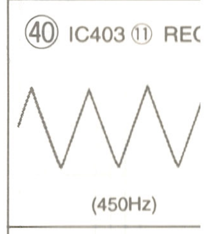
·SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo		►	
Drum phase servo		►►	
Drum servo (speed and phase)		►►►	
Capstan speed servo		►	
Capstan servo (speed and phase)		►»	
Ref.signal			

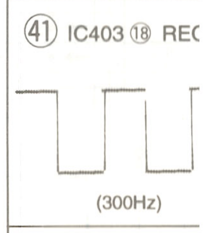
VC-167P BOA


(39) IC403 ①,②

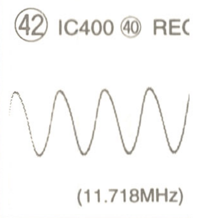
(150Hz)


(40) IC403 ⑪ REC

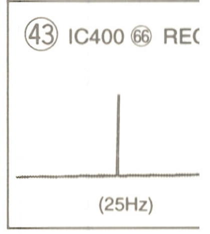
(450Hz)


(41) IC403 ⑱ REC

(300Hz)


(42) IC400 (40) REC

(11.718MHz)


(43) IC400 (66) REC

(25Hz)

FP-249 (MODE
JK-129 (JACK)
TZ-3 (VISTA)

4-19)

4-20)

4-20)

4-23)

4-39)

E 4-15)

.-15,
, 4-32)

4-15)

4-20)

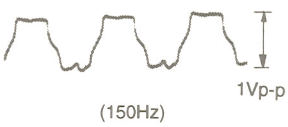
4-32)

4-25)

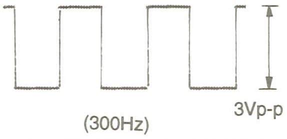
C/PB	PB

VC-167P BOARD

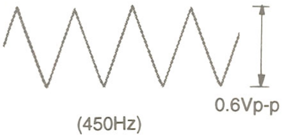
㊴ IC403 ①,② REC/PB



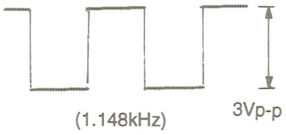
㊹ IC400 (67) REC/PB



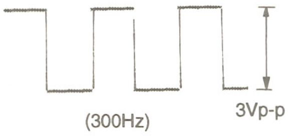
㊵ IC403 ⑪ REC/PB



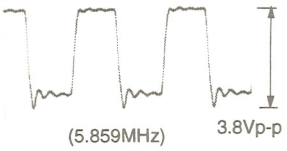
㊺ IC400 (68),(75) REC/PB



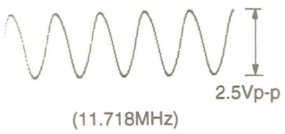
㊶ IC403 ⑱ REC/PB



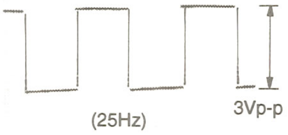
㊻ IC400 (76) REC/PB



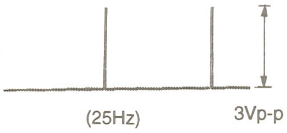
㊷ IC400 ㊵ REC/PB



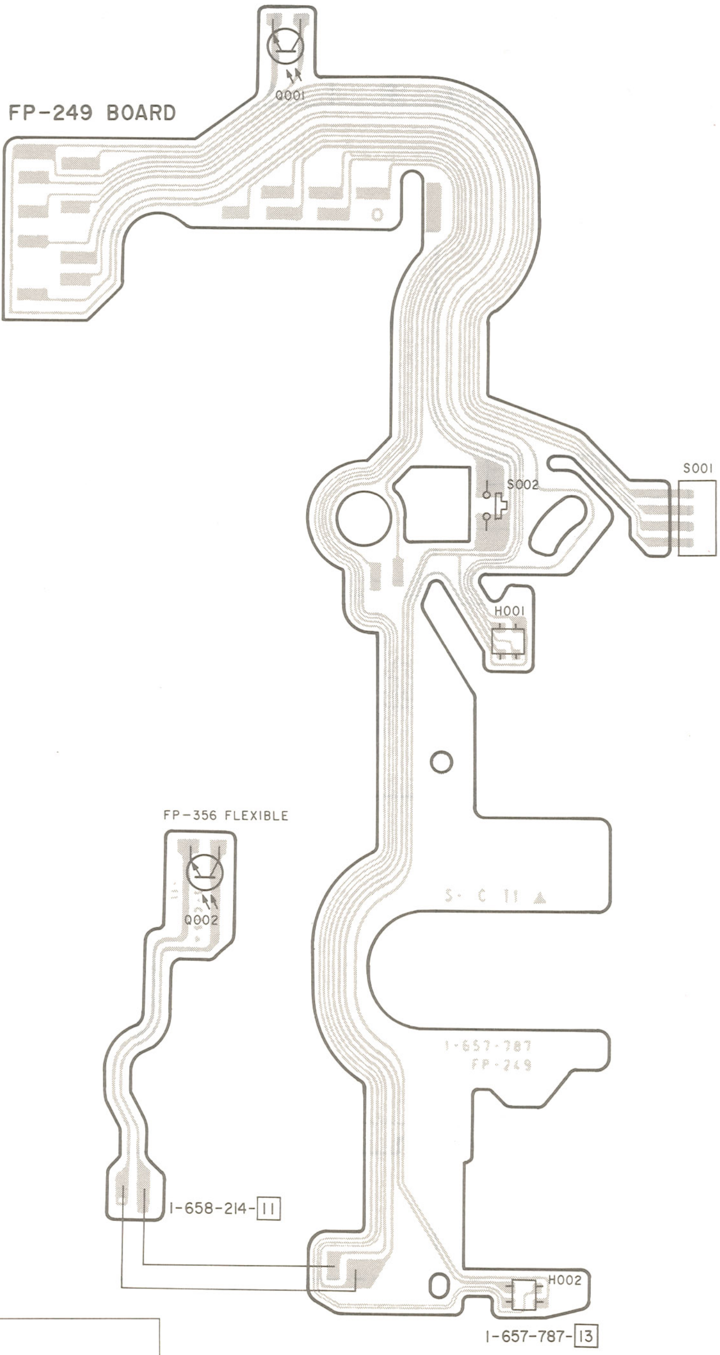
㊼ IC400 (97) REC/PB

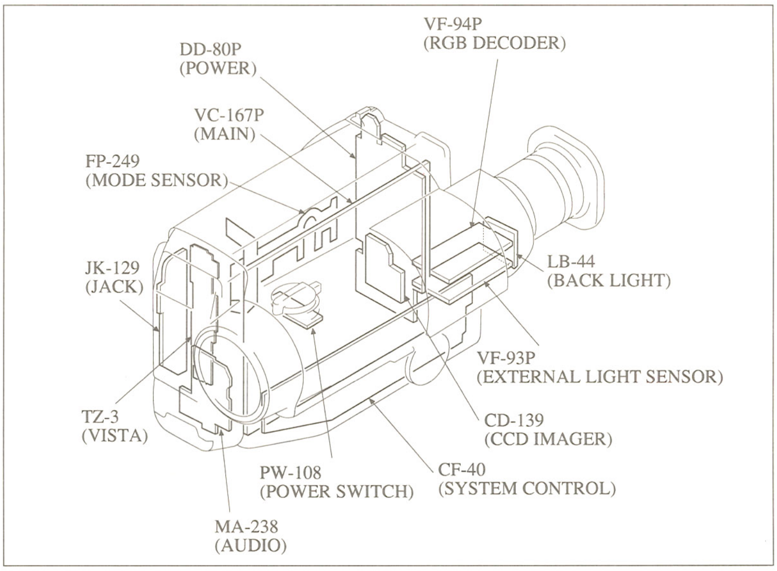


㊸ IC400 (66) REC/PB



FP-249 BOARD

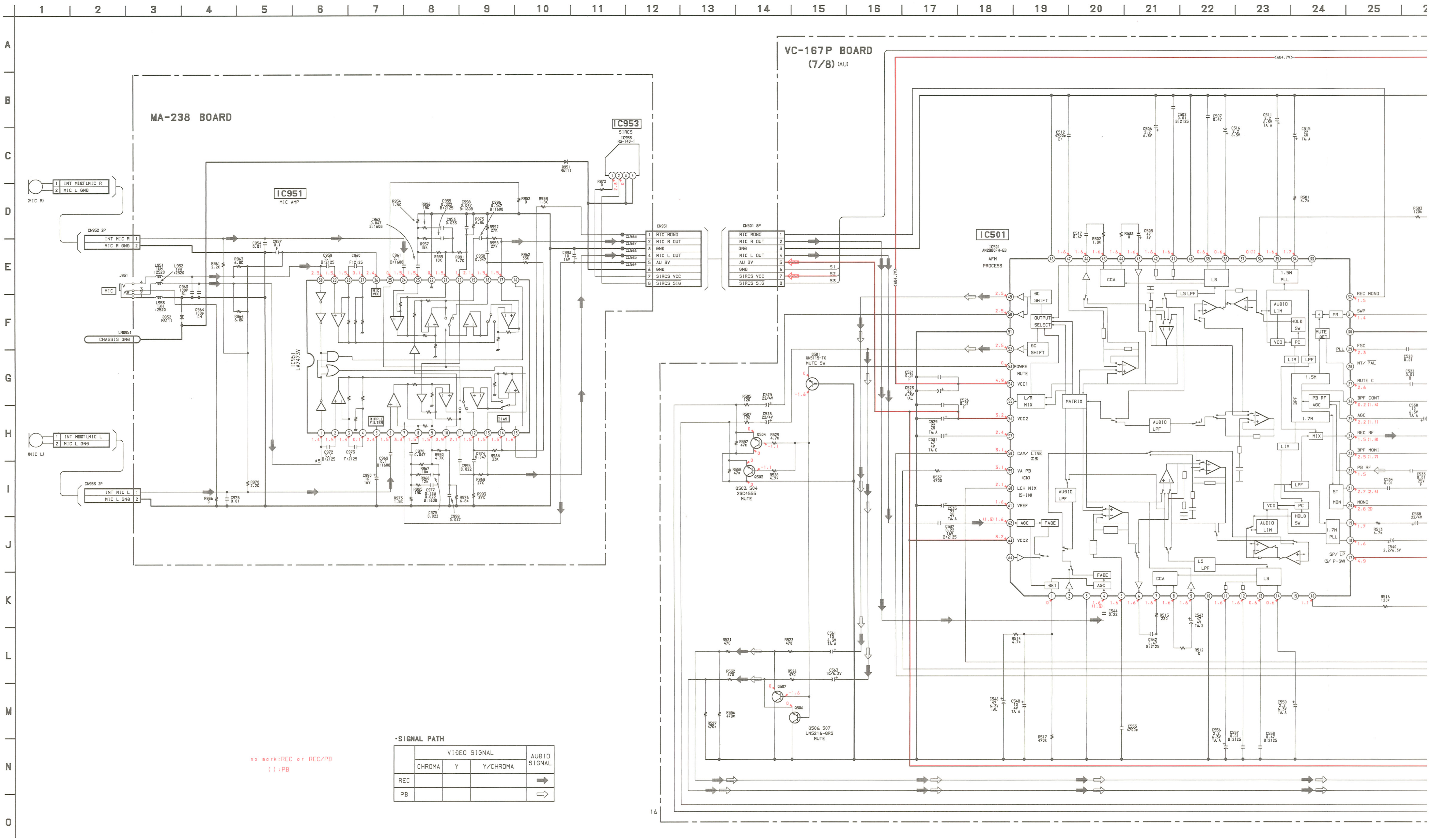

Q001
S001
S002
H001
FP-356 FLEXIBLE
Q002
S- C 11
1-657-787
FP-249
1-658-214-11
H002
1-657-787-13


DD-80P
(POWER)
VF-94P
(RGB DECODER)
VC-167P
(MAIN)
FP-249
(MODE SENSOR)
JK-129
(JACK)
LB-44
(BACK LIGHT)
VF-93P
(EXTERNAL LIGHT SENSOR)
TZ-3
(VISTA)
CD-139
(CCD IMAGER)
PW-108
(POWER SWITCH)
CF-40
(SYSTEM CONTROL)
MA-238
(AUDIO)

VC-167P (AUDIO AMP), MA-238 (AUDIO) SCHEMATIC DIAGRAMS

— Ref. No. VC-167P Board; 1,000 Series, MA-238 Board; 2,000 Series —

- See page 4-7 for VC-167P BOARD printed wiring board.

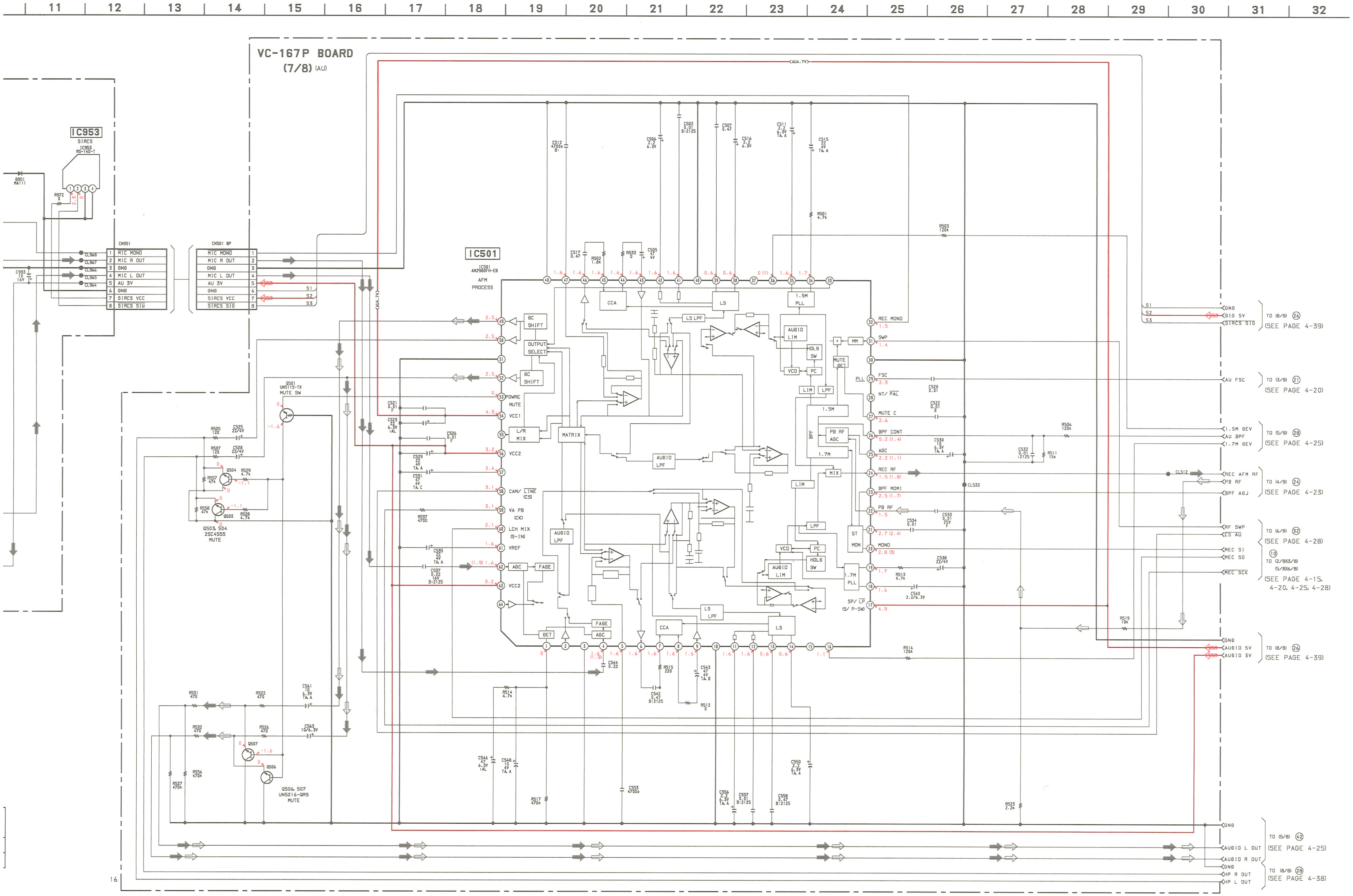

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
MA-238 BOARD
IC953
SIRCS
IC953 RS-140-T
IC951
MIC AMP
IC951 LA7473V
MIC R
MIC L
INT MIC R
INT MIC L
MIC L GND
MIC R GND
CN952 2P
CN953 2P
J951
MIC
CHASSIS GND
LND951
RIPPLE FILTER
BIAS
CN951
MIC MONO
MIC R OUT
GND
MIC L OUT
AU 3V
SIRCS VCC
SIRCS SIG
CN501 8P
VC-167P BOARD
(7/8) (AU)
IC501
IC501 AN2580FH-EB
AFM PROCESS
Q501 UN5115-TX MUTE SW
Q503, 504 2SC4555 MUTE
Q506, 507 UNS216-QRS MUTE
BC SHIFT
OUTPUT SELECT
POWRE MUTE
VCC1
L/R MIX
MATRIX
VCC2
CAM/LINE (CS)
VA PB (CX)
LCH MIX (S-IN)
VREF
AGC
FADE
DET
CCA
LS
LS LPF
PLL
AUDIO LIM
HOLD SW
VCO
PC
MUTE DET
LIM
LPF
BPF
PB RF AGC
MIX
ST MON
AUDIO LPF
REC MONO
SWP
FSC
NT/PAL
MUTE C
BPF CONT
ADC
REC RF
BPF MONI
PB RF
MONO
SP/LP (S/P-SW)
<AU4.7V>

no mark:REC or REC/PB
( ):PB

·SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

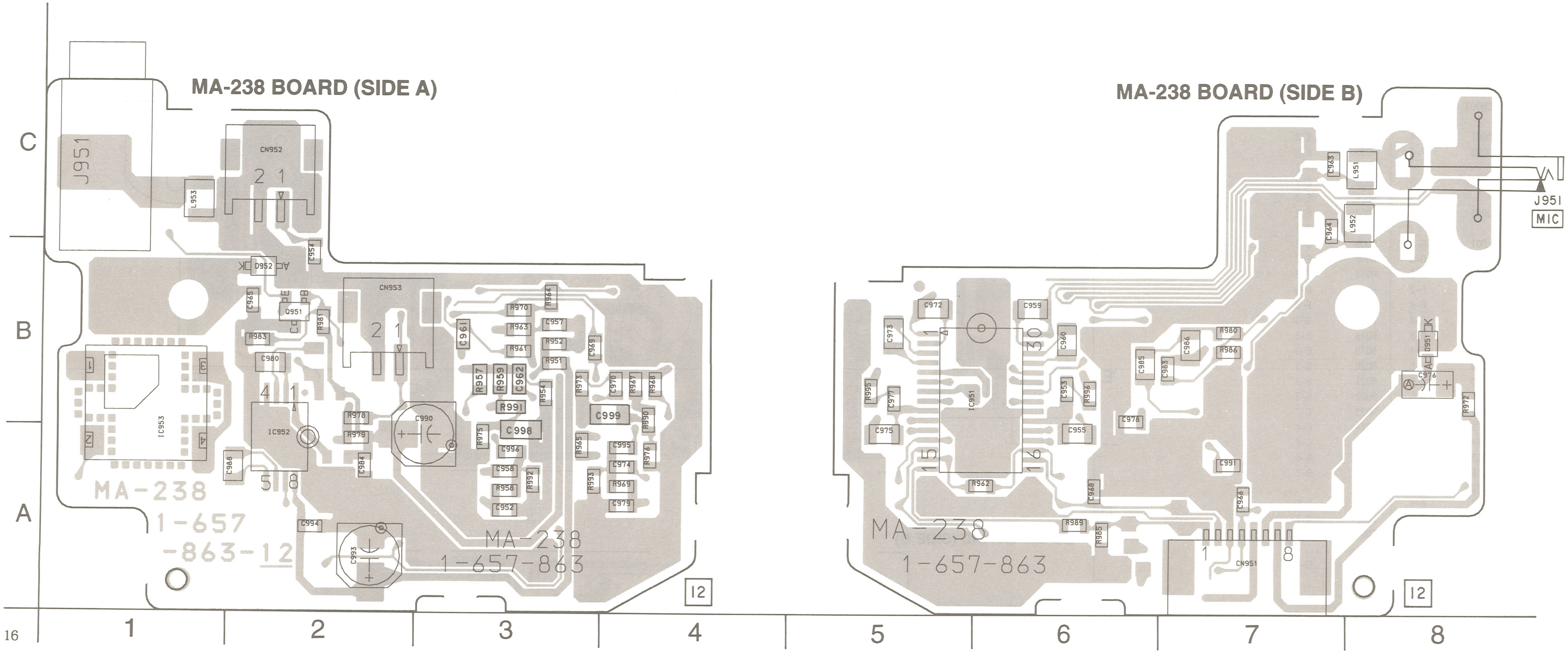
VC-167P BOARD printed wiring board.


11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
VC-167P BOARD
(7/8) (AU)
IC953
SIRCS
IC953
RS-140-T
D951
MA111
R972
0
C993
10
16V
CN951
CL968
CL967
CL966
CL965
CL964
1 MIC MONO
2 MIC R OUT
3 GND
4 MIC L OUT
5 AU 3V
6 GND
7 SIRCS VCC
8 SIRCS SIG
CN501 8P
S1
S2
S3
<AU4.7V>
IC501
IC501
AN2980FH-EB
AFM
PROCESS
DC SHIFT
OUTPUT SELECT
L/R MIX
MATRIX
AUDIO LPF
AGC
FADE
DET
CCA
LS
LS LPF
1.5M PLL
AUDIO LIM
HOLD SW
VCO
PC
LIM
LPF
MM
MUTE DET
1.5M
BPF
PB RF AGC
1.7M
MIX
ST MON
1.7M PLL
49
50
51
52
53 POWRE MUTE
54 VCC1
55
56 VCC2
57
58 CAM/ LINE (CS)
59 VA PB (CK)
60 LCH MIX (S-IN)
61 VREF
62
63 VCC2
64
32 REC MONO
31 SWP
30
29 FSC
PLL
28 NT/ PAL
27 MUTE C
26 BPF CONT
25 AGC
24 REC RF
23 BPF MOMI
22 PB RF
21
20 MONO
19
18
17 SP/ LP (S/ P-SW)
Q501
UN5115-TX
MUTE SW
R505 120
C525 22/4V
R507 120
C528 22/4V
Q504
R529 4.7k
R557 47k
R558 47k
Q503
R528 4.7k
Q503, 504
2SC4555
MUTE
R531 470
R522 470
C541 10 6.3V TA A
R532 470
R524 470
C543 10/6.3V
Q507
Q506
R554 470k
R527 470k
Q506, 507
UN5216-QRS
MUTE
C512 4700p B
C506 2.2 6.3V
C502 0.01 B:2125
C507 0.47
C516 2.2 6.3V
C511 2.2 6.3V TA A
C515 22 4V TA A
R501 4.7k
R503 120k
C517 0.47
R502 1.8k
R533 0
C505 47 4V
C521 0.01
C523 22 6.3V TAL
C526 0.01 F
C529 22 4V TA A
C531 47 4V TA C
R537 4700
C535 22 4V TA A
C537 0.22 16V B:2125
C520 0.01
C522 0.01 B
C530 10 6.3V TA A
C532 0.01 B:2125
R511 15k
R506 120k
CL533
C534 0.01
C533 0.01 25V F
C538 22/4V
R513 4.7k
C540 2.2/6.3V
R516 120k
R519 10k
C544 0.22
R515 220
C542 0.47 B:2125
C543 47 4V TA B
R512 0
R514 4.7k
C546 47 6.3V TAL
C548 10 4V TA A
R517 470k
C553 4700p
C550 2.2 6.3V TA A
C556 2.2 6.3V TA A
C557 0.01 B:2125
C558 0.47 B:2125
R523 2.2k
CL512
GND
DIG 5V
SIRCS SIG
TO (8/8) ㉖
(SEE PAGE 4-39)
AU FSC
TO (3/8) ㉑
(SEE PAGE 4-20)
1.5M DEV
AU BPF
1.7M DEV
TO (5/8) ㉘
(SEE PAGE 4-25)
REC AFM RF
PB RF
BPF ADJ
TO (4/8) ㉔
(SEE PAGE 4-23)
RF SWP
CS AU
MEC SI
MEC SO
MEC SCK
TO (6/8) ㉜
(SEE PAGE 4-28)
⑩
TO (2/8)(3/8)
(5/8)(6/8)
(SEE PAGE 4-15,
4-20, 4-25, 4-28)
GND
AUDIO 5V
AUDIO 3V
TO (8/8) ㉖
(SEE PAGE 4-39)
GND
AUDIO L OUT
AUDIO R OUT
GND
HP R OUT
HP L OUT
TO (5/8) ㊷
(SEE PAGE 4-25)
TO (8/8) ㉘
(SEE PAGE 4-38)
16

MA-238 (AUDIO) PRINTED WIRING BOARD

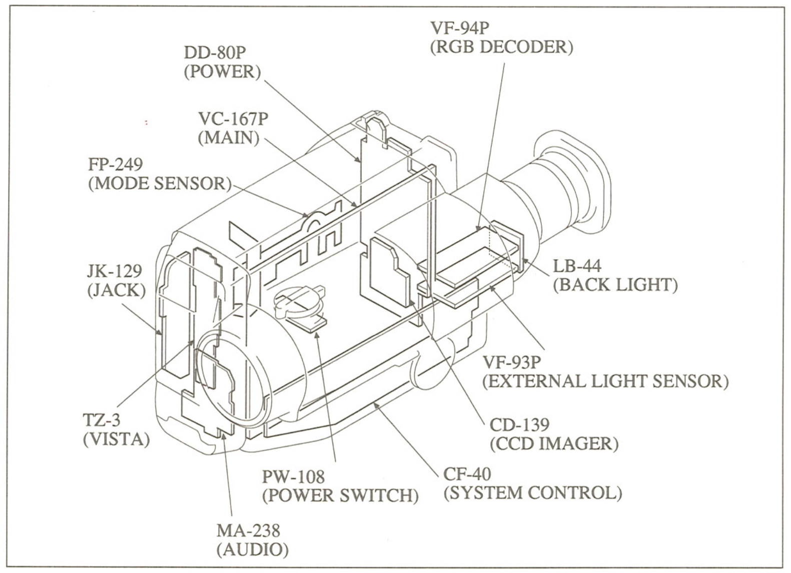
— Ref. No. MA-238 Board; 2,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.


MA-238 BOARD (SIDE A)
MA-238 BOARD (SIDE B)
C
B
A
16
1
2
3
4
5
6
7
8
J951
CN952
L953
C954
D952
CN953
C965
Q951
R981
R983
C980
IC953
IC952
R978
R979
C984
C990
C986
C961
R957
R959
C962
R970
R963
R961
R964
C957
R952
R951
R991
C998
R954
R973
C970
R967
R968
C969
C999
R990
R975
C994
C958
R956
C952
R992
R965
C995
C974
R969
C979
R993
R976
C994
C993
MA-238
1-657
-863-12
MA-238
1-657-863
12
C963
L951
L952
C964
J951
MIC
C972
C959
C973
C960
R995
C977
C951
R953
R996
C975
C955
R962
C968
R989
R985
C985
C983
C986
R980
R986
C978
C991
C966
D951
C976
R972
CN951
1
8
15
16
30
MA-238
1-657-863
12

MA-238 BOARD

C953	B–6	C978	B–6	L951	C–8	R972	B–8
C953	B–6	C990	B–3	L952	C–8	R973	B–3
C954	B–2	C993	A–2	L953	C–1	R975	A–3
C955	B–6	C995	C–4			R976	A–4
C957	B–3	C996	A–3	R952	B–3	R986	B–7
C958	A–3	C998	A–3	R954	B–3	R989	A–6
C959	B–6	C999	B–4	R957	B–3	R990	B–4
C960	B–6			R957	B–3	R991	B–3
C961	B–3	CN951	A–7	R958	A–3	R992	A–3
C962	B–3	CN952	C–2	R959	B–3	R993	A–3
C963	C–7	CN953	B–2	R961	B–1	R995	B–5
C964	C–7			R962	A–6	R996	B–6
C969	B–3	D951	B–8	R963	B–1		
C970	B–4	D952	B–2	R964	B–1		
C972	B–5			R965	A–3		
C973	B–5	IC951	B–5	R967	B–4		
C974	C–4	IC953	B–1	R968	B–4		
C975	A–5			R969	A–4		
C977	B–5	J951	C–1	R970	B–1		


DD-80P
(POWER)
VF-94P
(RGB DECODER)
VC-167P
(MAIN)
FP-249
(MODE SENSOR)
JK-129
(JACK)
LB-44
(BACK LIGHT)
VF-93P
(EXTERNAL LIGHT SENSOR)
TZ-3
(VISTA)
CD-139
(CCD IMAGER)
CF-40
(SYSTEM CONTROL)
PW-108
(POWER SWITCH)
MA-238
(AUDIO)

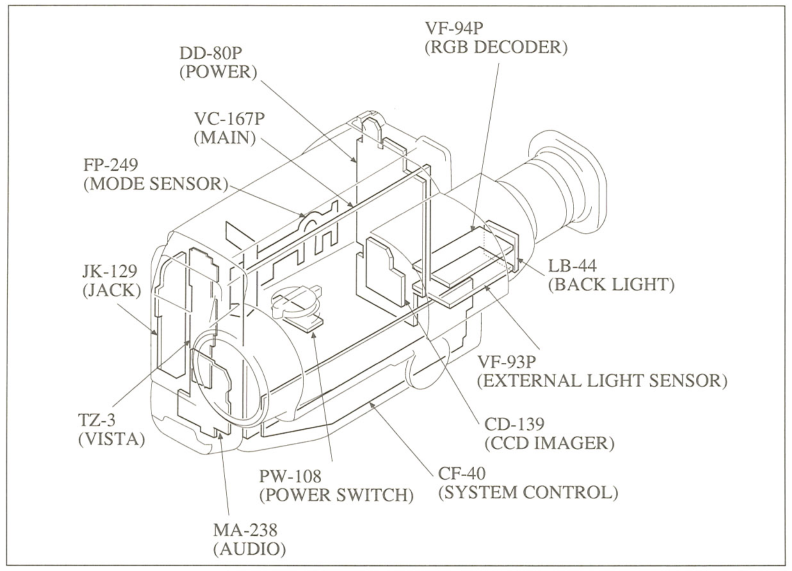
DD-80P (POWER) PRINTED WIRING BOARD

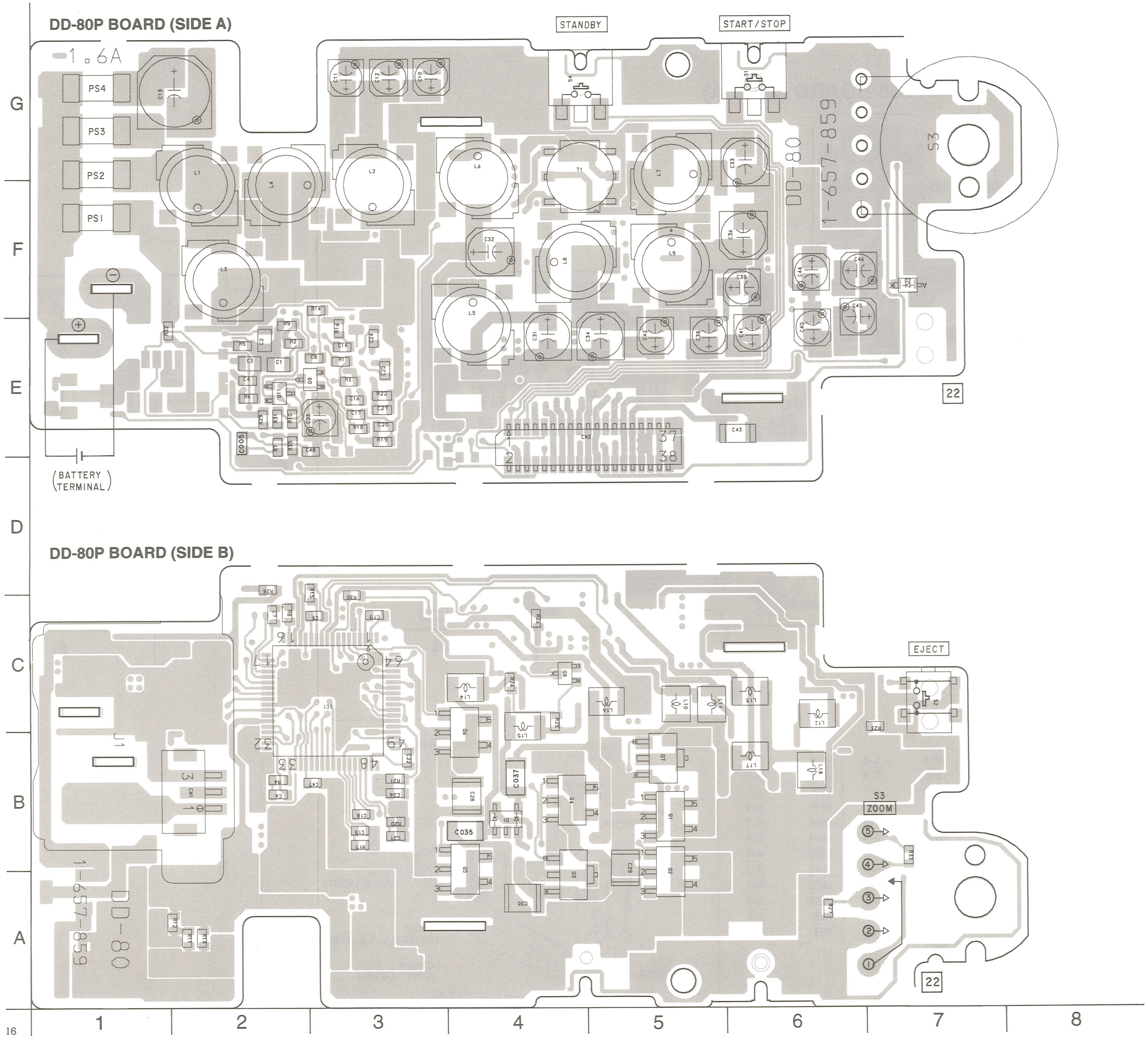
— Ref. No. DD-80P Board; 1,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

DD-80P BOARD

C001	E–2	C045	F–6	Q004	B–4
C002	E–2	C046	F–6	Q005	B–4
C003	E–2	C047	B–3	Q006	B–4
C004	E–2	C048	E–3	Q007	B–5
C005	E–2			Q008	C–4
C006	B–2	CN003	E–5		
C007	C–2			R001	E–3
C008	E–3	D001	B–4	R002	E–2
C009	C–3	D002	F–7	R003	E–3
C010	G–3			R004	B–2
C011	G–3	IC001	C–3	R005	E–2
C012	G–3			R006	E–2
C013	G–1	J001	B–1	R007	E–2
C014	E–3			R008	C–2
C016	E–3	L001	G–2	R009	E–2
C018	B–3	L002	G–3	R010	E–2
C019	C–3	L003	F–2	R014	F–3
C022	B–3	L004	F–2	R015	D–3
C023	E–3	L005	F–4	R016	E–3
C024	E–3	L006	G–4	R017	B–3
C025	E–3	L007	G–5	R018	E–3
C026	B–3	L008	F–4	R019	E–3
C027	E–3	L009	F–5	R020	B–3
C028	B–4	L010	C–5	R021	B–3
C029	B–5	L011	C–5	R022	E–3
C030	A–4	L012	C–6	R023	C–7
C031	E–4	L013	C–6	R024	C–4
C032	F–4	L014	C–4	R025	C–4
C033	G–6	L015	B–4	R027	A–6
C034	E–5	L016	C–5	R033	B–7
C035	B–4	L017	B–6		
C036	F–6	L018	B–6	S001	G–6
C037	B–4			S002	C–7
C038	E–5	PS002	G–1	S004	G–4
C039	F–6	PS003	G–1		
C040	E–6	PS004	G–1	T001	G–4
C041	E–6				
C042	E–5	Q001	B–5		
C043	E–6	Q002	A–5		
C044	F–6	Q003	A–4		

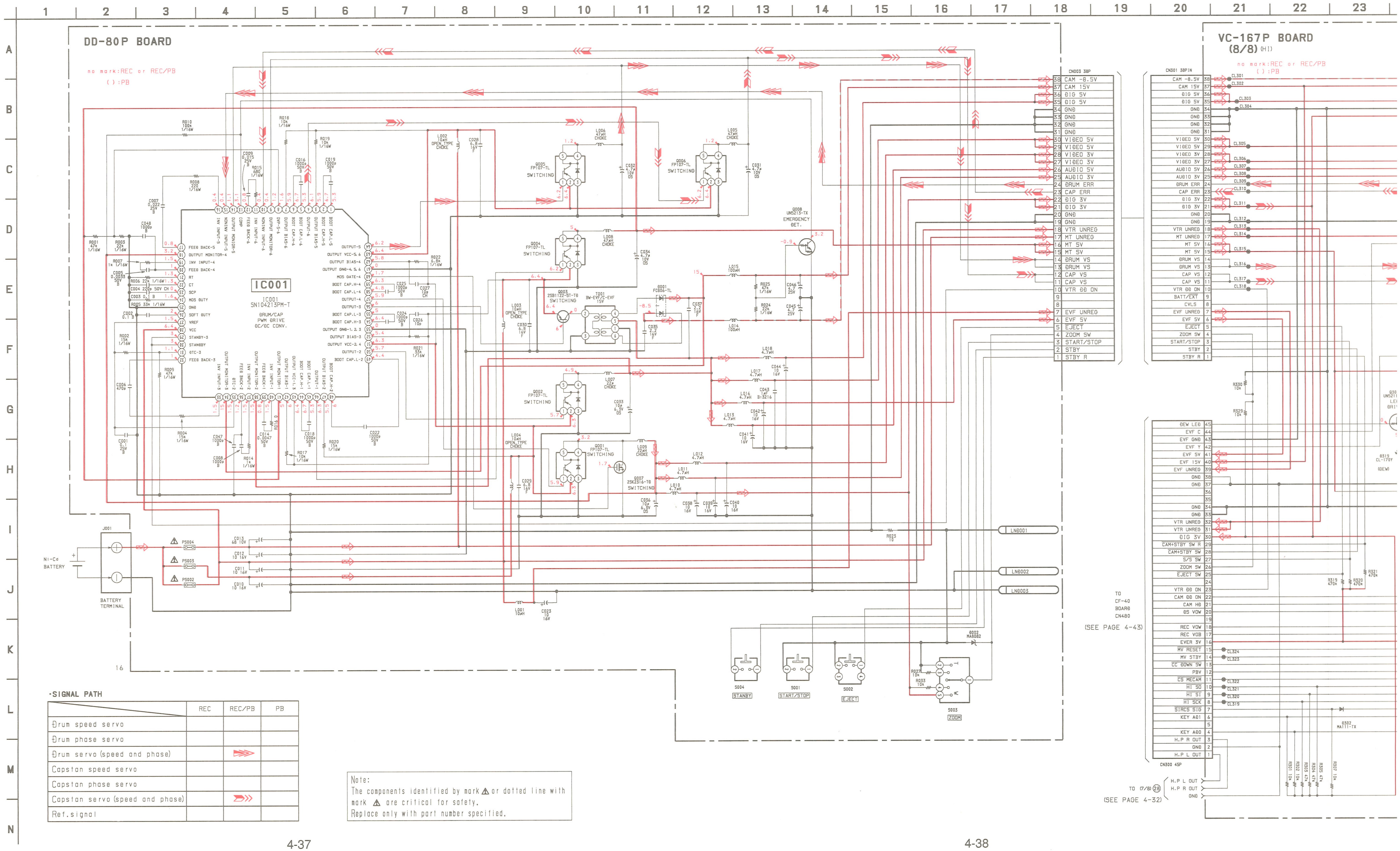

DD-80P
(POWER)
VF-94P
(RGB DECODER)
VC-167P
(MAIN)
FP-249
(MODE SENSOR)
JK-129
(JACK)
LB-44
(BACK LIGHT)
VF-93P
(EXTERNAL LIGHT SENSOR)
TZ-3
(VISTA)
CD-139
(CCD IMAGER)
PW-108
(POWER SWITCH)
CF-40
(SYSTEM CONTROL)
MA-238
(AUDIO)


DD-80P BOARD (SIDE A)
STANDBY
START/STOP
1.6A
PS4
PS3
PS2
PS1
BATTERY TERMINAL
1-657-859
DD-80
S3
22
DD-80P BOARD (SIDE B)
EJECT
S3
ZOOM
1-657-859
DD-80
22
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
16

DD-80P (POWER), VC-167P (VTR SWITCH) SCHEMATIC DIAGRAMS

— Ref. No. DD-80P Board, VC-167P Board; 1,000 Series —

• See page 4-7 for VC-167P BOARD printed wiring board.

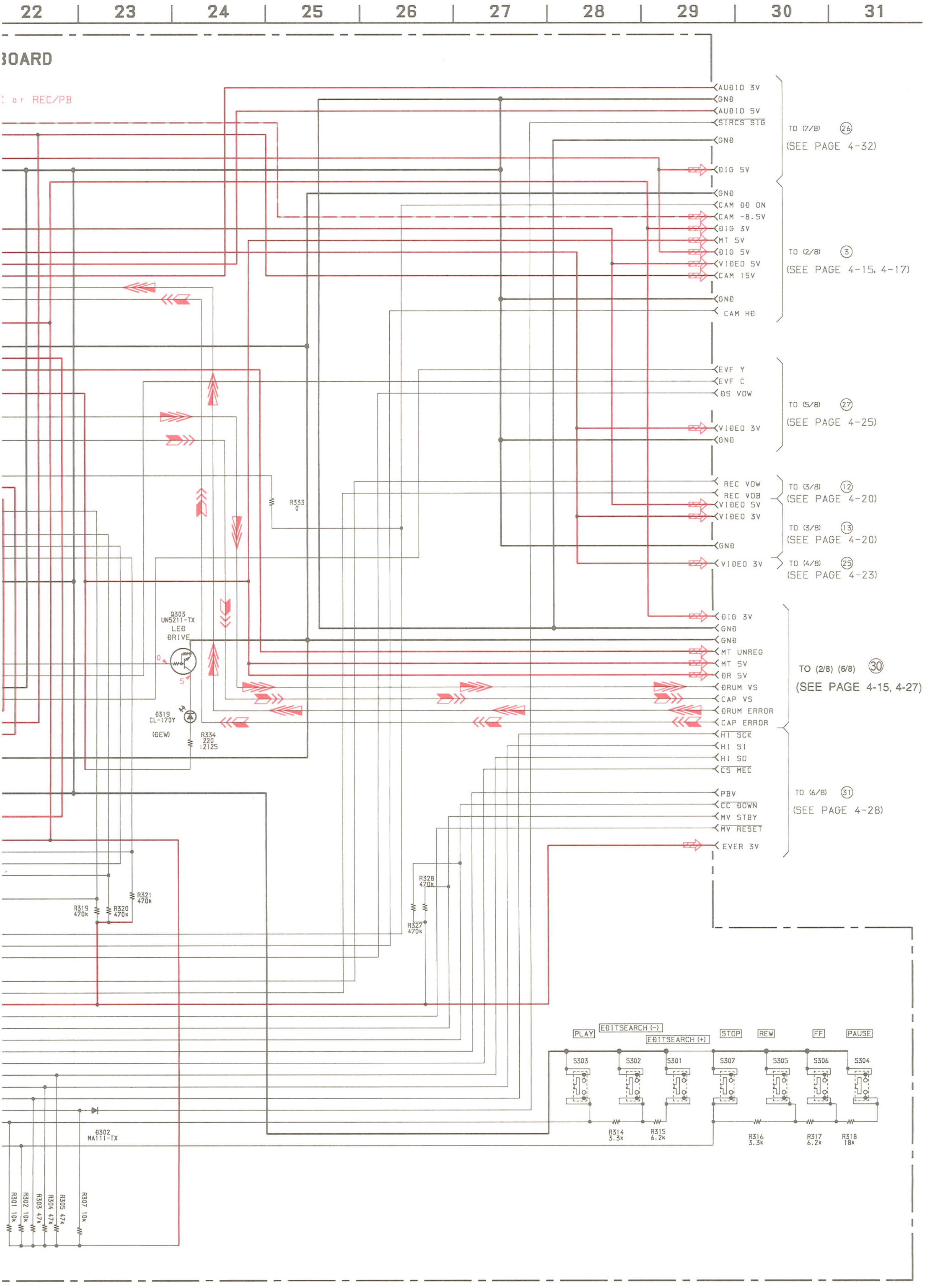


DD-80P BOARD
no mark:REC or REC/PB
( ):PB
IC001
SN104213PM-T
DRUM/CAP PWM DRIVE DC/DC CONV.
Q005 FP107-TL SWITCHING
Q006 FP107-TL SWITCHING
Q004 FP107-TL SWITCHING
Q002 FP107-TL SWITCHING
Q001 FP107-TL SWITCHING
Q003 2SB1122-ST-T8 SWITCHING
Q007 2SK2316-T8 SWITCHING
Q008 UN5213-TX EMERGENCY DET.
T001 SW-EVF/C-EVF 15V
D001 FC806-TL
J001
Ni-Cd BATTERY
BATTERY TERMINAL
PS004
PS003
PS002
CN003 38P
CAM -8.5V
CAM 15V
DIG 5V
VIDEO 5V
VIDEO 3V
AUDIO 5V
AUDIO 3V
DRUM ERR
CAP ERR
DIG 3V
GND
VTR UNREG
MT UNREG
MT 5V
DRUM VS
CAP VS
VTR DD ON
EVF UNREG
EVF 5V
EJECT
ZOOM SW
START/STOP
STBY
STBY R
LN0001
LN0002
LN0003
S004 STANBY
S001 START/STOP
S002 EJECT
S003 ZOOM
D002 MA8082
VC-167P BOARD
(8/8) (H1)
CN301 38PIN
CN300 45P
TO CF-40 BOARD CN480
(SEE PAGE 4-43)
TO (7/8) ㉘
(SEE PAGE 4-32)
D302 MA111-TX

·SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)		⋙	
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)		⋙	
Ref.signal			

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.


22
23
24
25
26
27
28
29
30
31
BOARD
or REC/PB
AUDIO 3V
GND
AUDIO 5V
SIRCS SIG
GND
DIG 5V
GND
CAM DD ON
CAM -8.5V
DIG 3V
MT 5V
DIG 5V
VIDEO 5V
CAM 15V
GND
CAM HD
TO (7/8) ㉖
(SEE PAGE 4-32)
TO (2/8) ③
(SEE PAGE 4-15, 4-17)
EVF Y
EVF C
DS VDW
VIDEO 3V
GND
TO (5/8) ㉗
(SEE PAGE 4-25)
REC VDW
REC VDB
VIDEO 5V
VIDEO 3V
TO (3/8) ⑫
(SEE PAGE 4-20)
GND
TO (3/8) ⑬
(SEE PAGE 4-20)
VIDEO 3V
TO (4/8) ㉕
(SEE PAGE 4-23)
R333
0
Q303
UN5211-TX
LED
DRIVE
0
5
D319
CL-170Y
(DEW)
R334
220
:2125
DIG 3V
GND
GND
MT UNREG
MT 5V
DR 5V
DRUM VS
CAP VS
DRUM ERROR
CAP ERROR
TO (2/8) (6/8) ㉚
(SEE PAGE 4-15, 4-27)
HI SCK
HI SI
HI SO
CS MEC
PBV
CC DOWN
MV STBY
MV RESET
EVER 3V
TO (6/8) ㉛
(SEE PAGE 4-28)
R321
470k
R319
470k
R320
470k
R328
470k
R327
470k
PLAY
EDITSEARCH (-)
EDITSEARCH (+)
STOP
REW
FF
PAUSE
S303
S302
S301
S307
S305
S306
S304
R314
3.3k
R315
6.2k
R316
3.3k
R317
6.2k
R318
18k
D302
MA111-TX
R301 10k
R302 10k
R303 47k
R304 47k
R305 47k
R307 10k

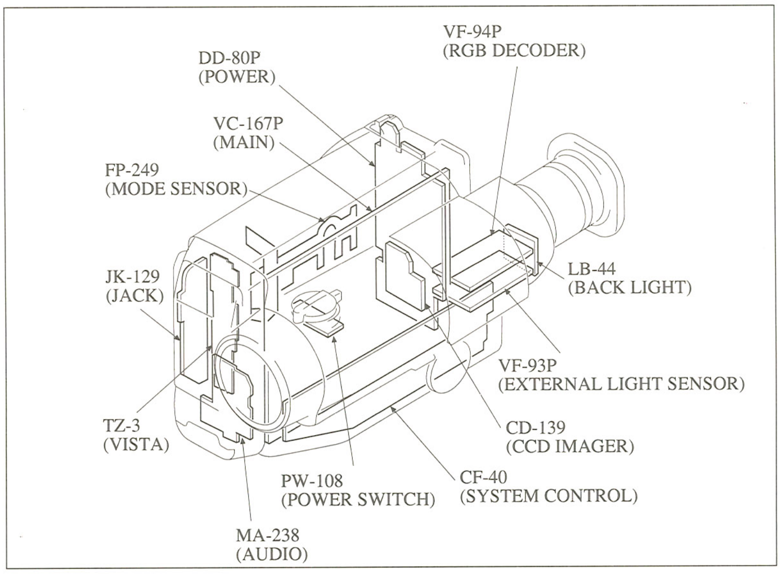
POWER
DD-80P/VC-167P(8/8)

CF-40 (SYSTEM CONTROL), PW-108 (POWER SWITCH) PRINTED WIRING BOARDS

— Ref. No. CF-40 Board, PW-108 Board; 2,000 Series —

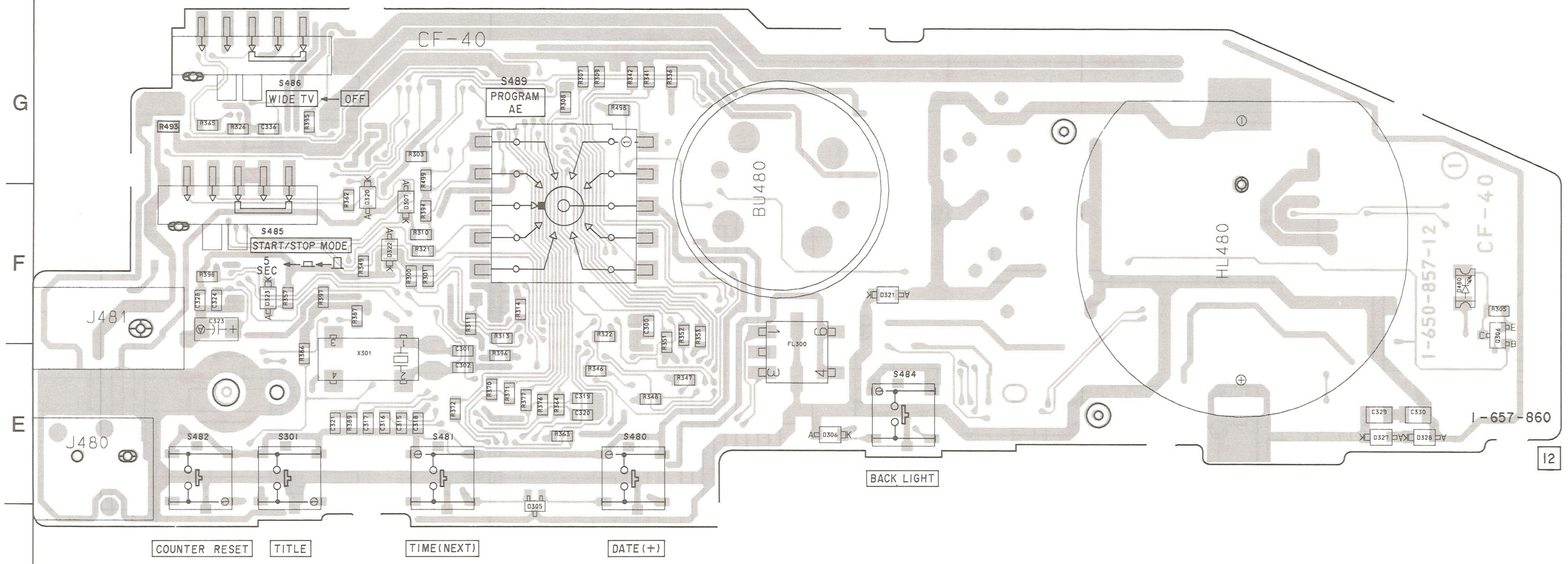
CF-40 BOARD

BU480	F–5
C300	F–4
C301	E–3
C302	E–3
C303	B–3
C304	B–3
C305	B–3
C306	B–5
C308	B–5
C310	B–5
C311	B–5
C312	C–5
C313	B–5
C314	A–4
C315	E–3
C316	E–3
C317	E–3
C318	E–3
C319	E–4
C320	E–4
C321	E–2
C323	F–2
C325	C–2
C326	C–2
C327	C–2
C328	F–2
C336	G–2
CN480	A–3
CN481	C–2
CN482	C–9
D300	B–2
D301	D–3
D303	B–7
D304	B–7
D309	A–1
D310	A–1
D312	B–7
D314	A–5
D315	A–4
D316	B–6
D317	B–5
D318	B–2
D321	F–6
D323	F–2
D324	D–2
D325	B–7
D326	B–7
D327	E–9
D328	E–9
D480	F–10
FL300	F–5
HL480	F–8
IC301	B–5
IC302	B–2
IC303	C–4
J480	E–1
J481	F–1
L300	B–3
PS301	A–6
Q301	A–4
Q302	B–4
Q303	A–1
Q304	A–1
Q305	C–9
R300	F–3
R301	F–3
R303	G–3
R304	B–6
R305	F–10
R306	B–6
R307	G–4
R308	G–4
R309	G–4
R310	F–3
R311	F–3
R312	B–4
R313	F–3
R314	F–4
R315	B–3
R316	B–3
R317	B–3
R318	B–3
R319	B–4
R320	B–4
R321	F–3
R322	F–4
R323	C–5
R324	B–4
R325	B–4
R326	G–2
R327	A–6
R331	A–7
R333	B–5
R334	B–5
R335	B–5
R336	G–5
R337	A–5
R338	A–4
R339	A–2
R340	A–2
R341	G–4
R342	G–4
R343	A–2
R345	C–5
R346	E–4
R347	E–5
R348	E–4
R350	C–5
R351	F–4
R352	F–5
R353	F–5
R354	C–5
R355	C–5
R356	C–5
R357	F–2
R358	C–5
R359	C–8
R362	F–2
R363	E–4
R364	E–4
R365	G–2
R370	E–3
R371	E–3
R372	E–3
R373	C–3
R374	C–3
R375	C–3
R376	E–4
R377	E–4
R378	C–3
R379	C–3
R380	C–3
R381	C–3
R384	B–3
R386	E–2
R387	F–3
R389	E–3
R390	B–3
R392	C–2
R393	C–2
R394	F–3
R395	G–2
R396	E–3
R397	F–2
R398	F–2
R399	B–3
R490	C–2
R491	A–1
R492	A–1
R493	G–1
R494	D–1
R495	D–1
R496	C–1
R497	C–1
R499	G–3
S300	B–7
S301	E–2
S480	E–4
S481	E–3
S482	E–2
S483	A–6
S484	E–6
S485	F–2
S486	G–2
S487	B–7
S488	B–6
S489	F–4
X302	C–3
XTL301	B–3

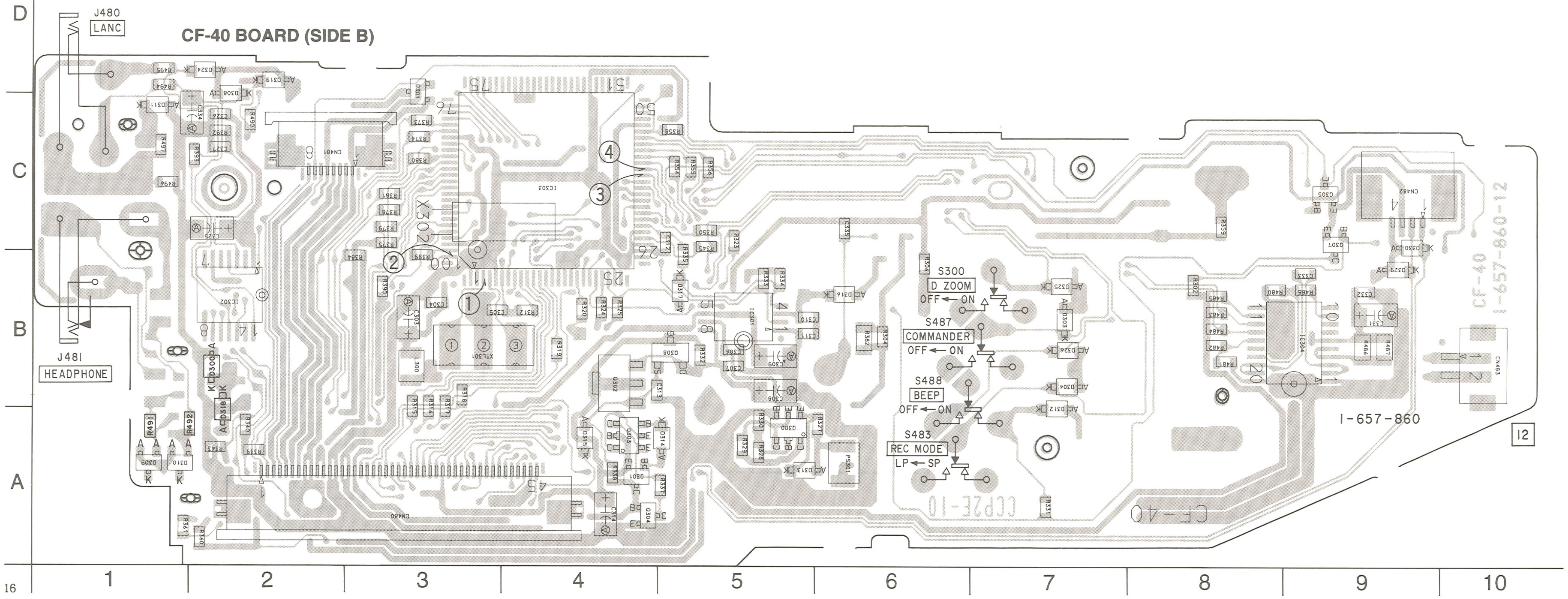

VF-94P
(RGB DECODER)
DD-80P
(POWER)
VC-167P
(MAIN)
FP-249
(MODE SENSOR)
JK-129
(JACK)
LB-44
(BACK LIGHT)
VF-93P
(EXTERNAL LIGHT SENSOR)
TZ-3
(VISTA)
CD-139
(CCD IMAGER)
PW-108
(POWER SWITCH)
CF-40
(SYSTEM CONTROL)
MA-238
(AUDIO)

There are few cases that the part printed on this diagram isn't mounted in this model.

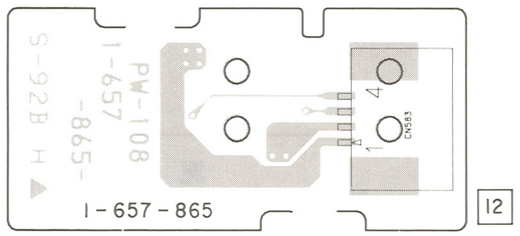
CF-40 BOARD (SIDE A)


G
F
E
CF-40
S486
WIDE TV
OFF
S489
PROGRAM AE
S485
START/STOP MODE
5 SEC
J481
J480
X301
BU480
HL480
FL300
S484
BACK LIGHT
S482
S301
S481
S480
COUNTER RESET
TITLE
TIME(NEXT)
DATE(+)
1-650-857-12
1-657-860
12

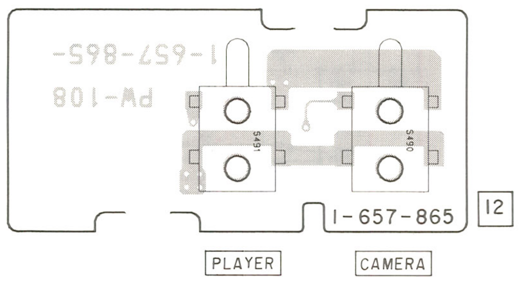
CF-40 BOARD (SIDE B)


D
C
B
A
J480
LANC
J481
HEADPHONE
IC303
IC302
X302
CN481
CN480
IC304
CN482
CN483
S300
D ZOOM
OFF ← ON
S487
COMMANDER
OFF ← ON
S488
BEEP
OFF ← ON
S483
REC MODE
LP ← SP
CCP2E-10
CF-40
1-657-860-12
1-657-860
12
1
2
3
4
5
6
7
8
9
10

PW-108 BOARD (SIDE A)

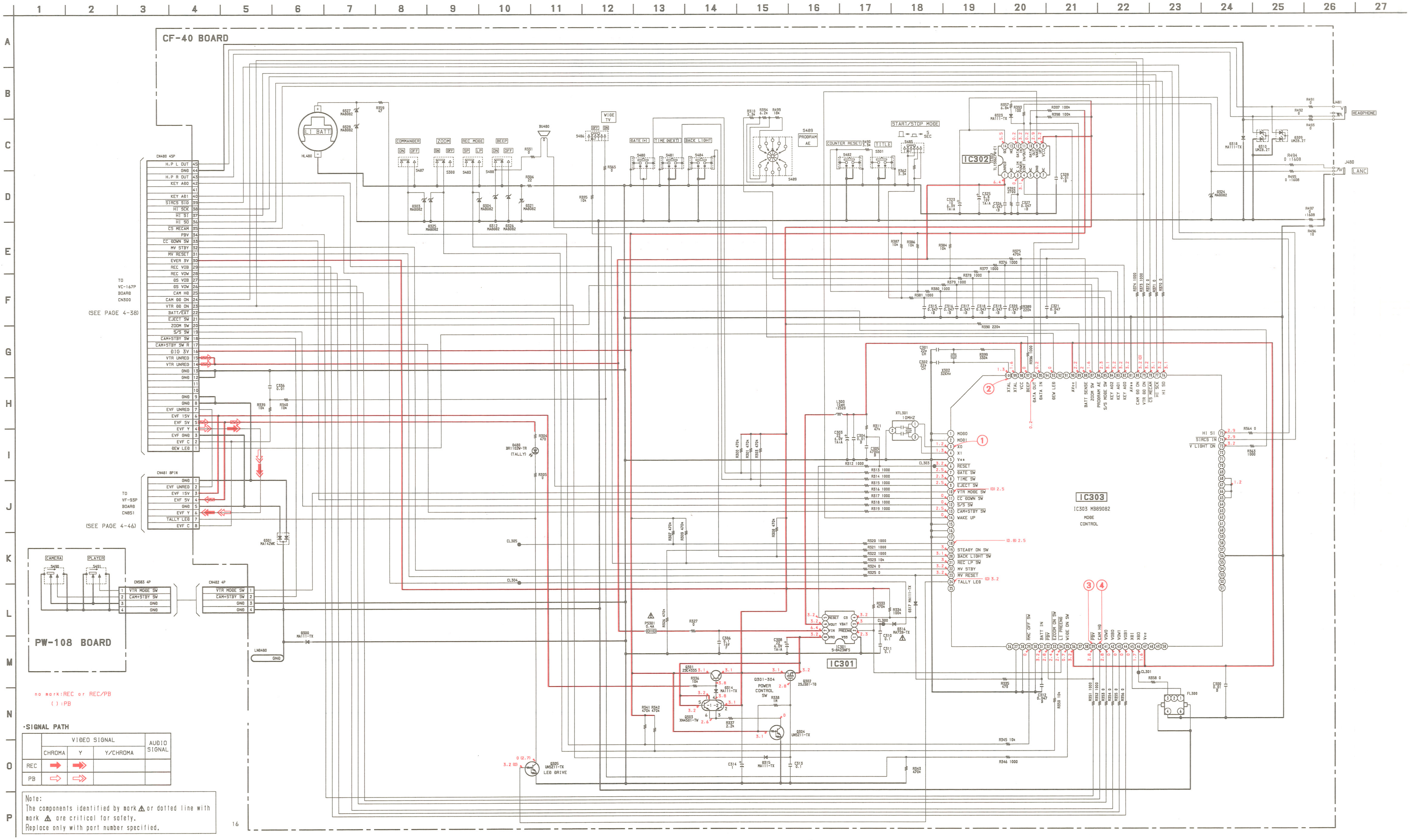

PW-108
1-657-865
S-928
12

PW-108 BOARD (SIDE B)


S491
S490
1-657-865
12
PLAYER
CAMERA

CF-40 (SYSTEM CONTROL), PW-108 (POWER SWITCH) SCHEMATIC DIAGRAMS

— Ref. No. CF-40 Board, PW-108 Board; 2,000 Series —


CF-40 BOARD
PW-108 BOARD
CN480 45P
TO VC-167P BOARD CN300 (SEE PAGE 4-38)
CN481 8PIN
TO VF-93P BOARD CN851 (SEE PAGE 4-46)
CN583 4P
CN482 4P
CAMERA
PLAYER
IC301
IC302
IC303
IC303 MB89082 MODE CONTROL
Q301-304 POWER CONTROL SW
Q305 UN5211-TX LED DRIVE
LI BATT
START/STOP MODE
COMMANDER
ZOOM
REC MODE
BEEP
WIDE TV
DATE (+)
TIME (NEXT)
BACK LIGHT
COUNTER RESET
TITLE
PROGRAM AE
HEADPHONE
LANC
J480
J481
XTL301 10MHZ
16

no mark:REC or REC/PB
( ) :PB

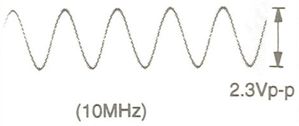
·SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»		
PB	⇨	⇨»		

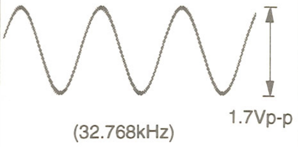
Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

CF-40 BOARD

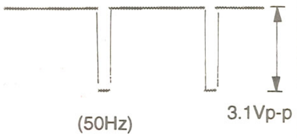
① IC303 ③ REC/PB



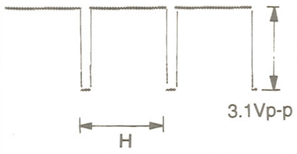
② IC303 (100) REC/PB



③ IC303 ㊴ REC/PB



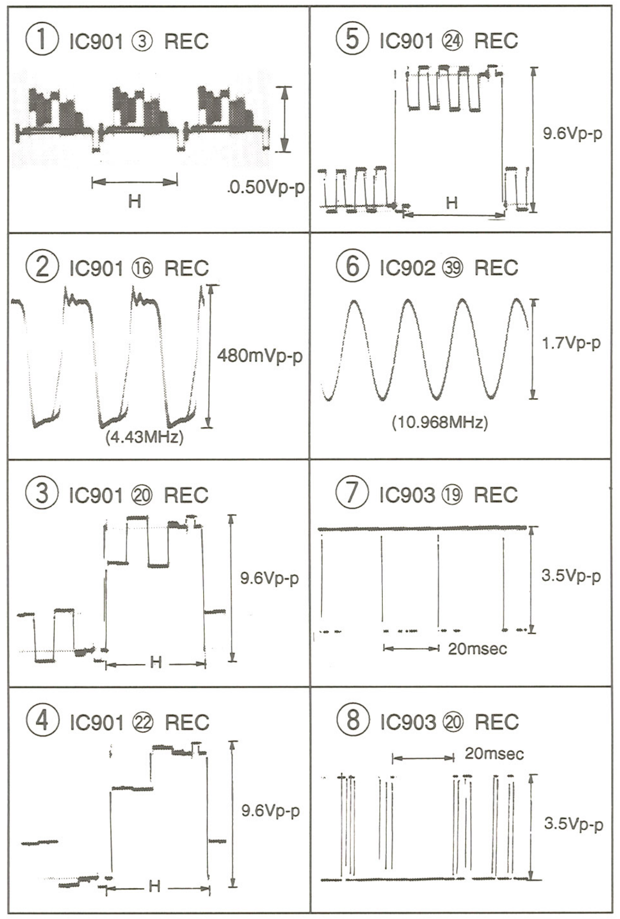
④ IC303 ㊵ REC/PB

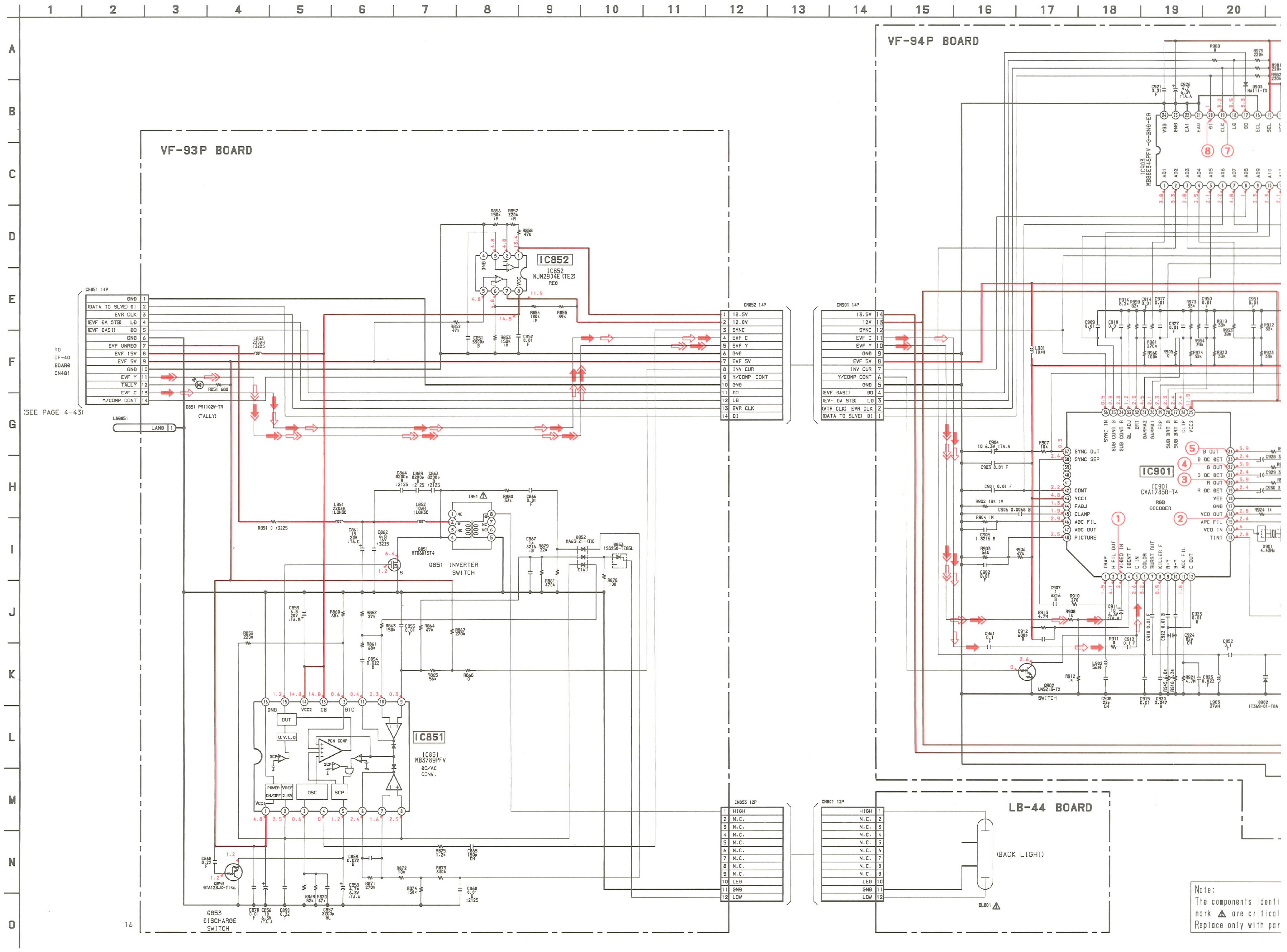


VF-93P (EXTERNAL LIGHT SENSOR), VF-94P (RGB DECODER), LB-44 (BACK LIGHT) SCHEMATIC DIAGRAMS

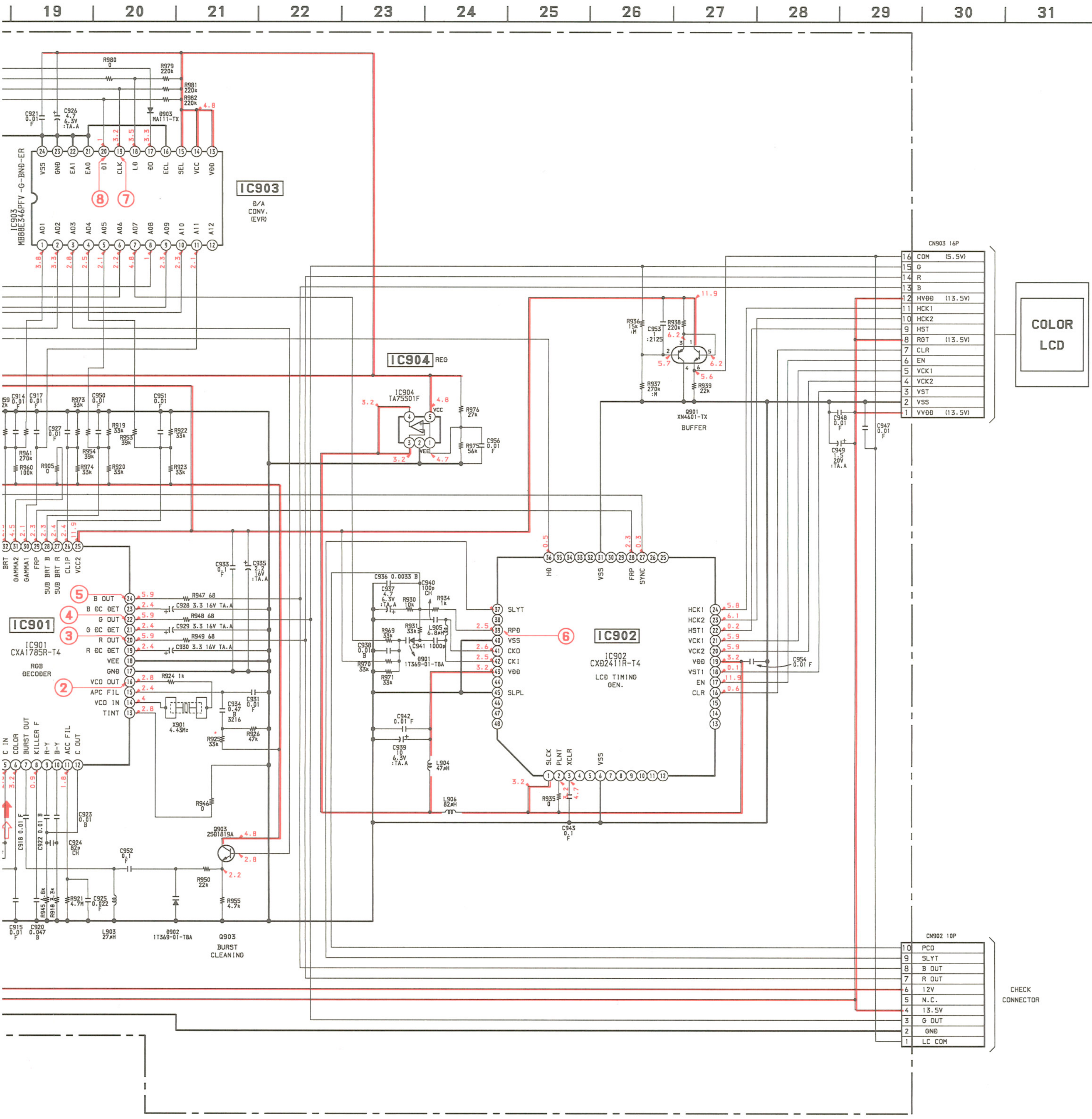
— Ref. No. VF-93P Board, VF-94P Board, LB-44 Board; 4,000 Series —

VF-94P BOARD




1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
VF-93P BOARD
VF-94P BOARD
LB-44 BOARD
CN851 14P
TO CF-40 BOARD CN481
(SEE PAGE 4-43)
GND
(DATA TO SLVE) OI
EVR CLK
(EVF OA STB) LO
(EVF OA SI) OO
EVF UNREG
EVF 15V
EVF 5V
EVF Y
TALLY
EVF C
Y/COMP CONT
LN0851
LAND
Q851 PR1102W-TR (TALLY)
IC852
NJM2904E (TE2)
REG
CN852 14P
13.5V
12.0V
SYNC
EVF C
EVF Y
GND
EVF 5V
INV CUR
Y/COMP CONT
GND
OO
LO
EVR CLK
OI
CN901 14P
T851
Q851 INVERTER SWITCH
IC851
MB3789PFV
DC/AC CONV.
Q853 DISCHARGE SWITCH
CN853 12P
HIGH
N.C.
LED
GND
LOW
CN801 12P
(BACK LIGHT)
BL801
IC901
CXA1785R-T4
RGB DECODER
IC903
MB88346BPFV-G-BND-ER
SYNC OUT
SYNC SEP
CONT
VCC1
FADJ
CLAMP
AGC FIL
AGC OUT
PICTURE
B OUT
B DC DET
G OUT
G DC DET
R OUT
R DC DET
VEE
GND
VCO OUT
APC FIL
VCO IN
TINT
Q902 UN5213-TX SWITCH
X901 4.43MHz
16

Note:
The components identi
mark ⚠ are critical
Replace only with par


19
20
21
22
23
24
25
26
27
28
29
30
31
IC903
D/A CONV. (EVR)
IC903 MB88E346PFV-G-BND-ER
VSS
GND
EA1
EA0
DI
CLK
LD
DO
ECL
SEL
VCC
VDD
AO1
AO2
AO3
AO4
AO5
AO6
AO7
AO8
AO9
A10
A11
A12
IC904 REG
IC904 TA75S01F
VCC
VEE
Q901 XN4601-TX
BUFFER
CN903 16P
COM (5.5V)
G
R
B
HVDD (13.5V)
HCK1
HCK2
HST
RGT (13.5V)
CLR
EN
VCK1
VCK2
VST
VSS
VVDD (13.5V)
COLOR LCD
IC901
IC901 CXA1785R-T4
RGB DECODER
B OUT
B DC DET
G OUT
G DC DET
R OUT
R DC DET
VEE
GND
VCO OUT
APC FIL
VCO IN
TINT
BRT
GAMMA2
GAMMA1
FRP
SUB BRT B
SUB BRT R
CLIP
VCC2
C IN
COLOR
BURST OUT
KILLER F
R-Y
B-Y
ACC FIL
C OUT
X901 4.43MHz
Q903 2SB1819A
Q903 BURST CLEANING
D902 1T369-01-T8A
D901 1T369-01-T8A
IC902
IC902 CXD2411R-T4
LCD TIMING GEN.
HD
VSS
FRP
SYNC
SLYT
RPD
VSS
CKO
CKI
VDD
SLPL
HCK1
HCK2
HST1
VCK1
VCK2
VDD
VST1
EN
CLR
SLCK
PLNT
XCLR
VSS
CN902 10P
PCO
SLYT
B OUT
R OUT
12V
N.C.
13.5V
G OUT
GND
LC COM
CHECK CONNECTOR
①
②
③
④
⑤
⑥
⑦
⑧

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

no mark:REC or REC/PB
( ):PB

·SIGNAL PATH

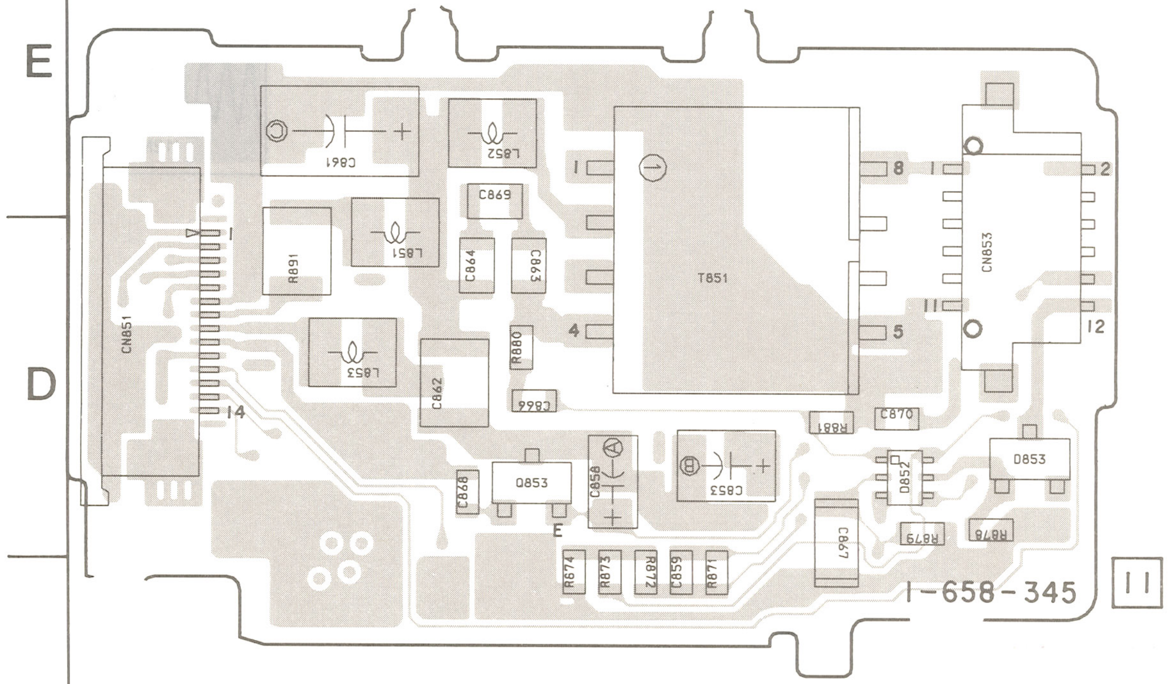
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	⇛		
PB	⇨	⇨		

VF-93P (EXTERNAL LIGHT SENSOR), VF-94P (RGB DECODER), LB-44 (BACK LIGHT) PRINTED WIRING BOARDS

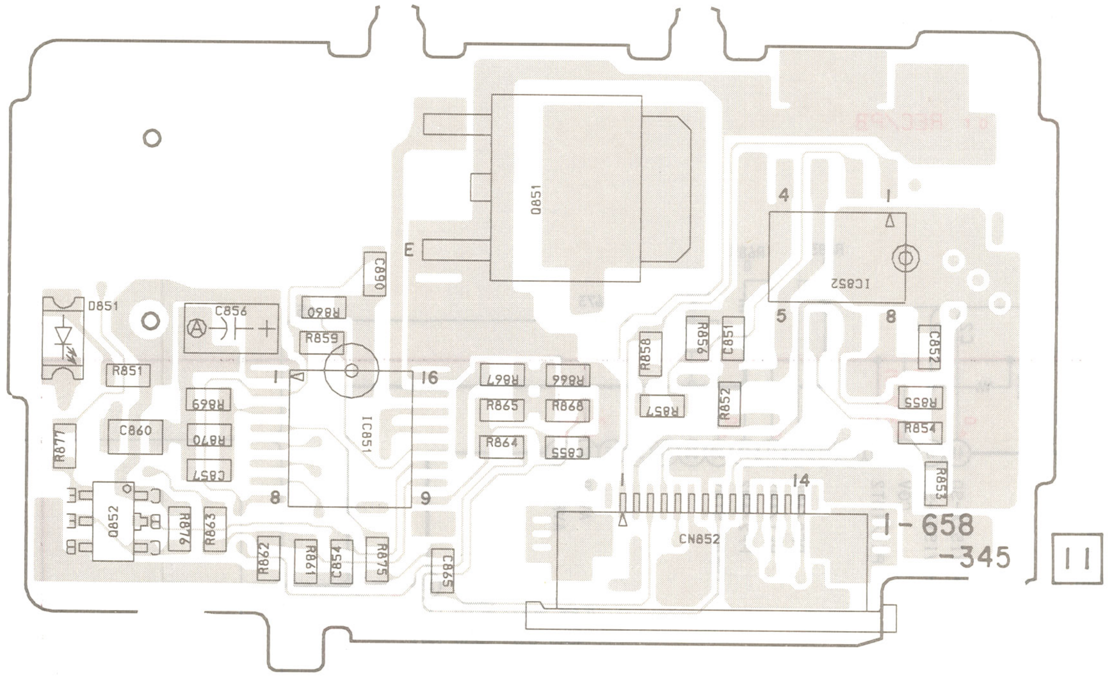
— Ref. No. VF-93P Board, VF-94P Board, LB-44 Board; 4,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

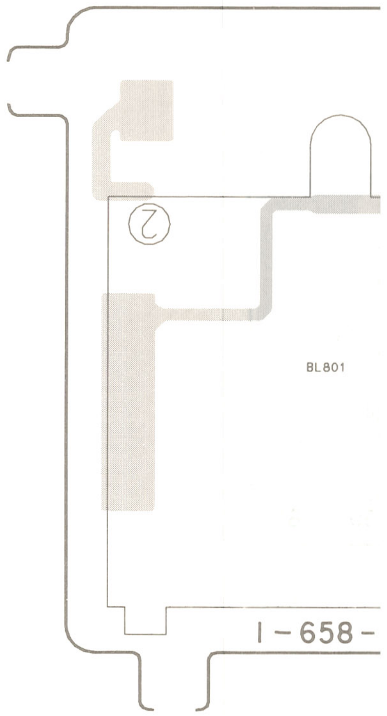
VF-93P BOARD (SIDE A)


C861
L852
C869
L851
R891
C864
C863
T851
CN853
CN851
L853
C862
R880
C866
C870
R881
D852
D853
C868
Q853
C858
C853
C867
R879
R878
R874
R873
R872
C859
R871
1-658-345
11

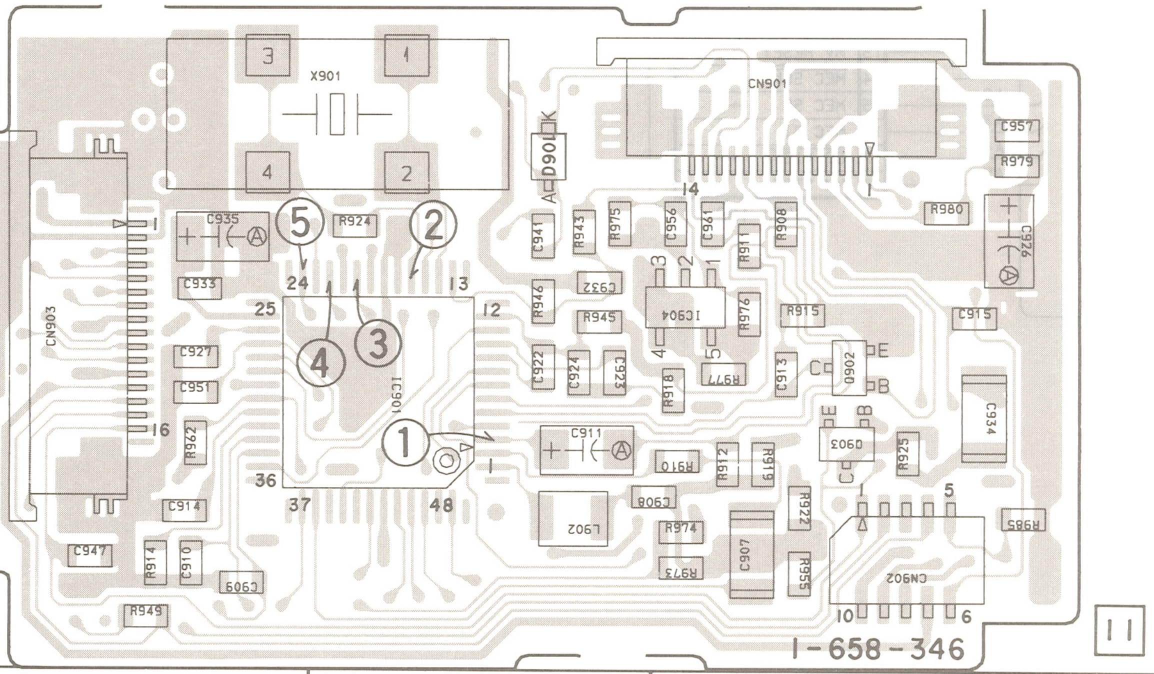
VF-93P BOARD (SIDE B)


D851
C856
R860
R859
C890
R851
IC851
Q851
IC852
R858
R856
C851
C852
R867
R866
R865
R868
R864
C855
R857
R852
R855
R854
R853
C860
R869
R870
C857
R877
Q852
R876
R863
R862
R861
C854
R875
C865
CN852
1-658-345
11

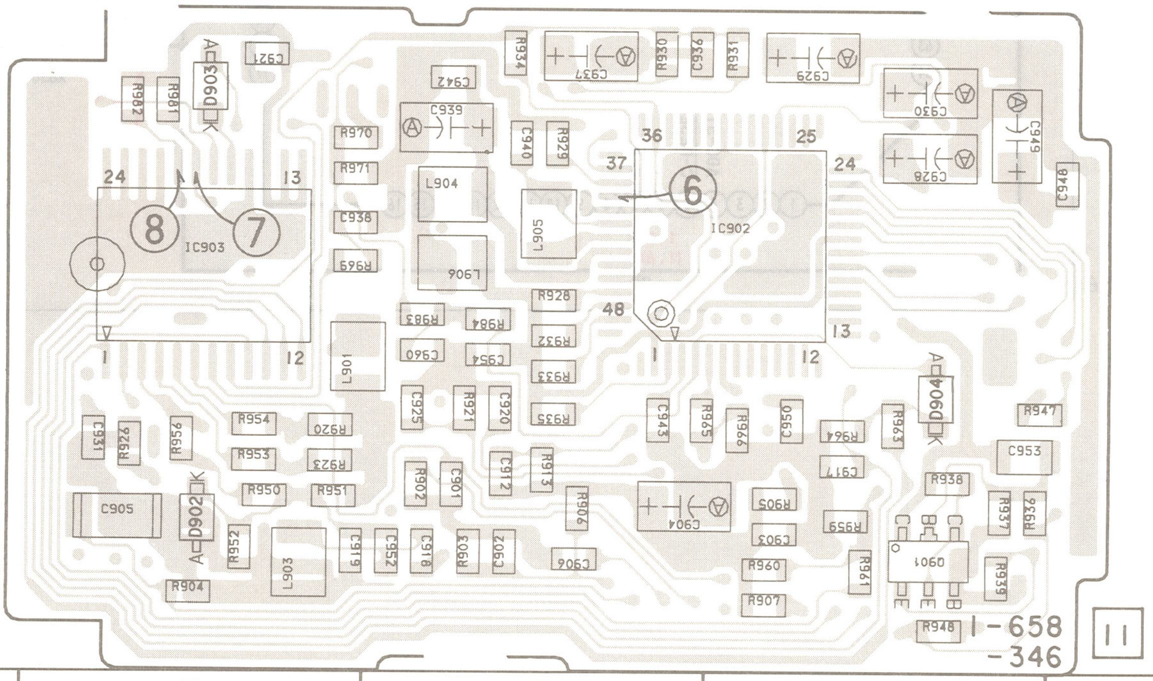
LB-44 BOARD (S



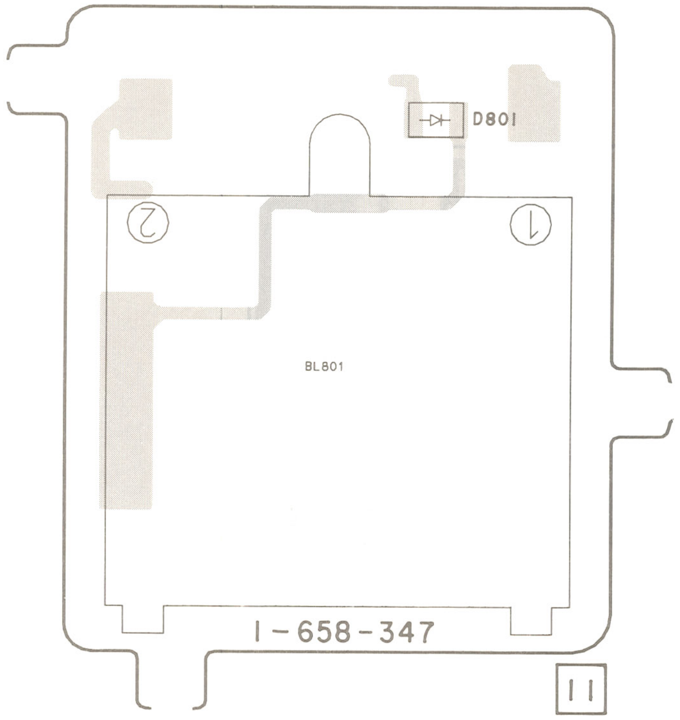
VF-94P BOARD (SIDE A)


X901
CN901
D901
CN903
C935
R924
C933
IC901
C927
C951
R962
C914
C947
R914
R910
C909
R949
C941
R943
R975
C956
C961
R911
R908
R980
C926
C932
IC904
R946
R945
R976
R915
C915
C922
C924
C923
R918
R977
C913
Q902
C934
C911
R916
R912
R919
Q903
R925
R983
L902
R974
R973
C907
R922
R955
CN902
R985
1-658-346
11

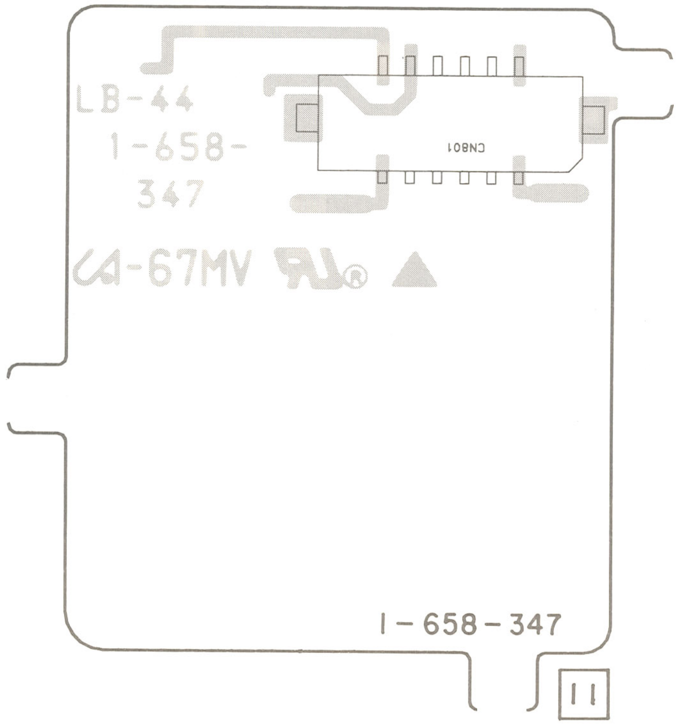
VF-94P BOARD (SIDE B)


D903
R982
R981
C921
C942
R934
C937
R930
C936
R931
C929
C930
C949
C939
C940
R929
R970
R971
L904
C938
R969
IC903
IC902
C905
C928
C926
C962
L906
R928
R983
R984
R932
R933
C950
C95
L901
R935
R954
R953
R950
R920
R923
R951
C925
R921
C920
R913
C912
R902
C901
R906
C943
R965
R966
C960
R964
C917
C904
R905
C903
R960
R907
R963
D904
R947
C953
R938
R937
R936
Q901
R939
R941
R948
D902
C905
R952
R904
L903
C919
C952
C918
R903
C902
R903
1-658-346
11

LB-44 BOARD (SIDE A)


D801
②
①
BL801
1-658-347
11

LB-44 BOARD (SIDE B)

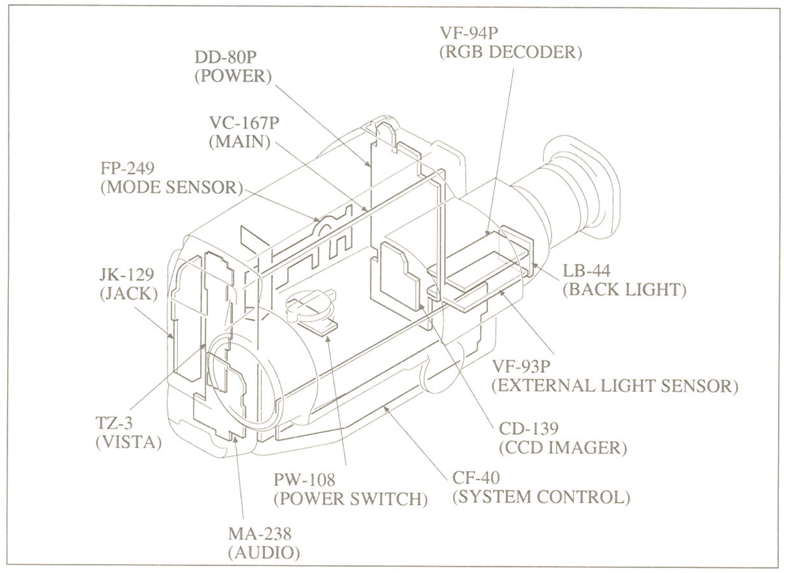

LB-44
1-658-
347
CN801
CA-67MV
1-658-347
11

VF-94P BOARD

C901	A-6	C925	A-6	C951	A-1	L903	A-5	R919	A-3	R950	A-5
C902	A-6	C926	B-4	C952	A-6	L904	B-6	R920	A-5	R953	A-5
C903	A-7	C927	A-1	C953	A-7	L905	B-6	R921	A-6	R954	A-5
C904	A-6	C928	B-7	C954	A-6	L906	B-6	R922	A-3	R955	A-3
C905	A-5	C929	B-7	C956	B-3			R923	A-5	R959	A-7
C906	A-6	C930	B-7	C961	B-3	Q901	A-7	R924	B-2	R960	A-7
C907	A-3	C931	A-5			Q902	A-3	R925	A-3	R961	A-7
C908	A-3	C933	B-1	CN901	B-3	Q903	A-3	R926	A-5	R969	B-5
C909	A-1	C934	A-3	CN902	A-3			R930	B-6	R970	B-5
C910	A-1	C935	B-1	CN903	A-1	R902	A-6	R931	B-7	R971	B-5
C911	A-2	C936	B-6			R903	A-6	R934	B-6	R973	A-3
C912	A-6	C937	B-6	D901	B-2	R904	A-5	R935	A-6	R974	A-3
C913	A-3	C938	B-5	D902	A-5	R905	A-7	R936	A-7	R975	B-2
C914	A-1	C939	B-6	D903	B-5	R906	A-6	R937	A-7	R976	B-3
C915	B-3	C940	A-6			R907	A-7	R938	A-7	R979	B-4
C917	A-7	C941	B-2	IC901	A-2	R908	B-3	R939	A-7	R980	B-3
C918	A-6	C942	B-6	IC902	B-7	R910	A-3	R945	B-2	R981	B-5
C920	A-6	C943	A-6	IC903	B-5	R911	B-3	R946	B-2	R982	B-5
C921	B-5	C947	A-1	IC904	B-3	R912	A-3	R947	A-7		
C922	A-2	C948	B-8			R913	A-6	R948	A-7	X901	B-2
C923	A-2	C949	B-7	L901	A-5	R914	A-1	R949	A-1		
C924	A-2	C950	A-7	L902	A-2	R918	A-3				

VF-93P BOARD

C851	D-6	C866	D-2	IC851	D-5	R855	D-7	R870	D-5
C852	D-7	C867	D-3	IC852	D-6	R856	D-6	R871	C-2
C853	D-2	C868	D-2			R857	D-6	R872	C-2
C854	C-5	C869	E-2	L851	D-1	R858	D-6	R873	C-2
C855	D-6	C870	D-3	L852	E-2	R859	D-5	R874	C-2
C856	D-5	C890	D-5	L853	D-1	R860	D-5	R875	C-5
C857	D-5					R861	C-5	R878	D-3
C858	D-2	CN851	D-1	Q851	E-5	R862	C-5	R879	D-3
C859	C-2	CN852	D-6	Q853	D-2	R863	D-5	R880	D-2
C860	D-4	CN853	D-3			R864	D-5	R881	D-3
C861	E-2			R851	D-4			R891	D-1
C862	D-2	D851	D-4	R852	D-6	R865	D-5		
C863	D-2	D852	D-3	R853	D-7	R867	D-5	T851	D-2
C864	D-2	D853	D-3	R854	D-7	R868	D-6		
C865	C-5					R869	D-5		

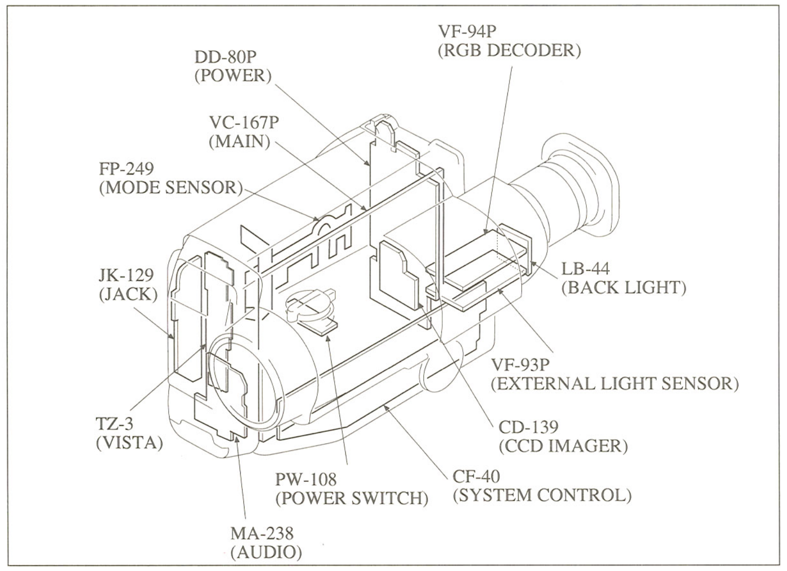

DD-80P
(POWER)
VF-94P
(RGB DECODER)
VC-167P
(MAIN)
FP-249
(MODE SENSOR)
JK-129
(JACK)
LB-44
(BACK LIGHT)
VF-93P
(EXTERNAL LIGHT SENSOR)
TZ-3
(VISTA)
CD-139
(CCD IMAGER)
PW-108
(POWER SWITCH)
CF-40
(SYSTEM CONTROL)
MA-238
(AUDIO)

TZ-3 (VISTA) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

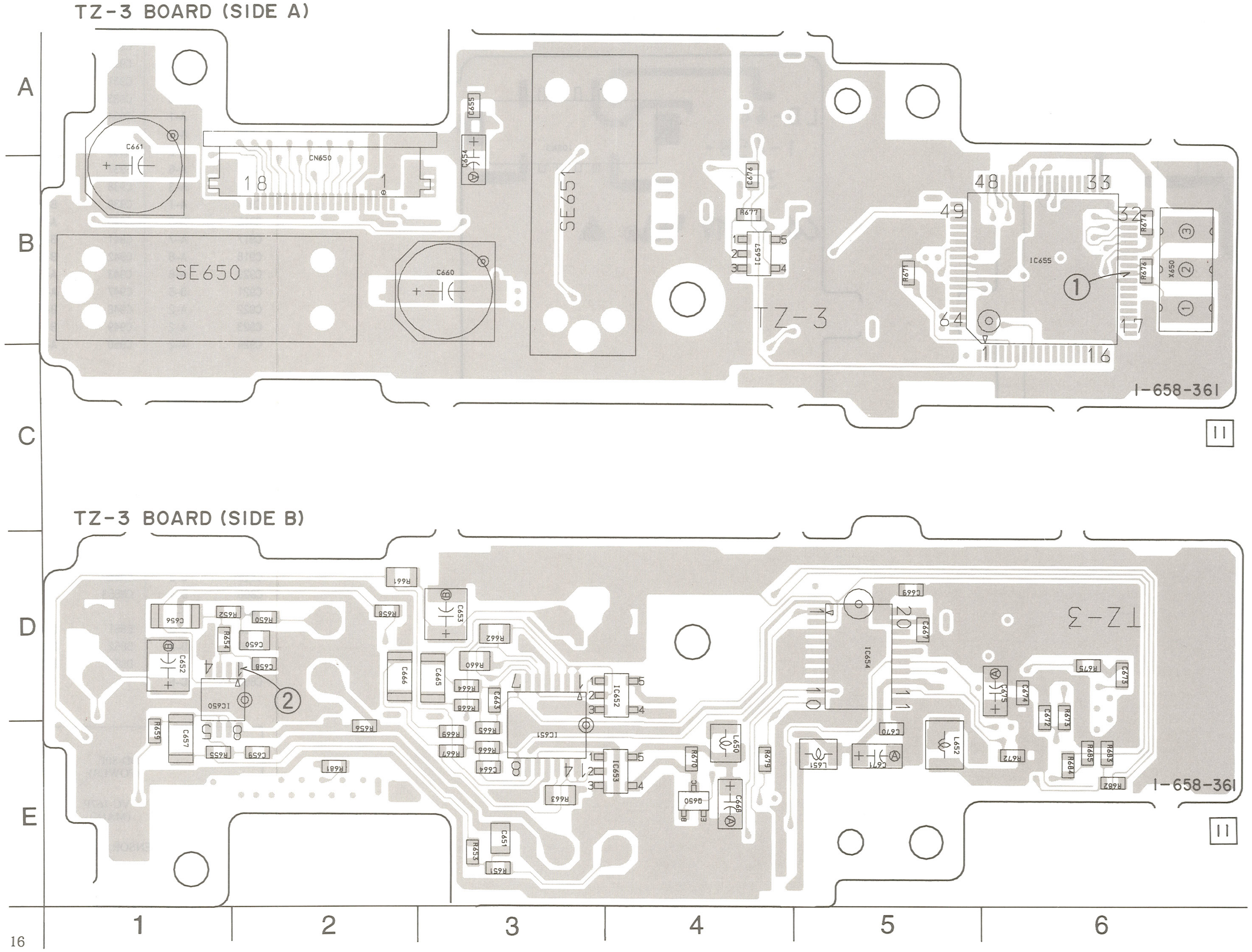
— Ref. No. : TZ-3 Board; 5,000 Series —

TZ-3 BOARD

C672	D-6
C673	D-6
C674	D-6
C675	D-6
CN650	B-2
IC655	B-6
L652	D-5
Q650	E-4
R672	D-6
R673	D-6
R674	B-6
R675	D-6
R676	B-6
R683	D-6
R685	D-6
X650	B-6

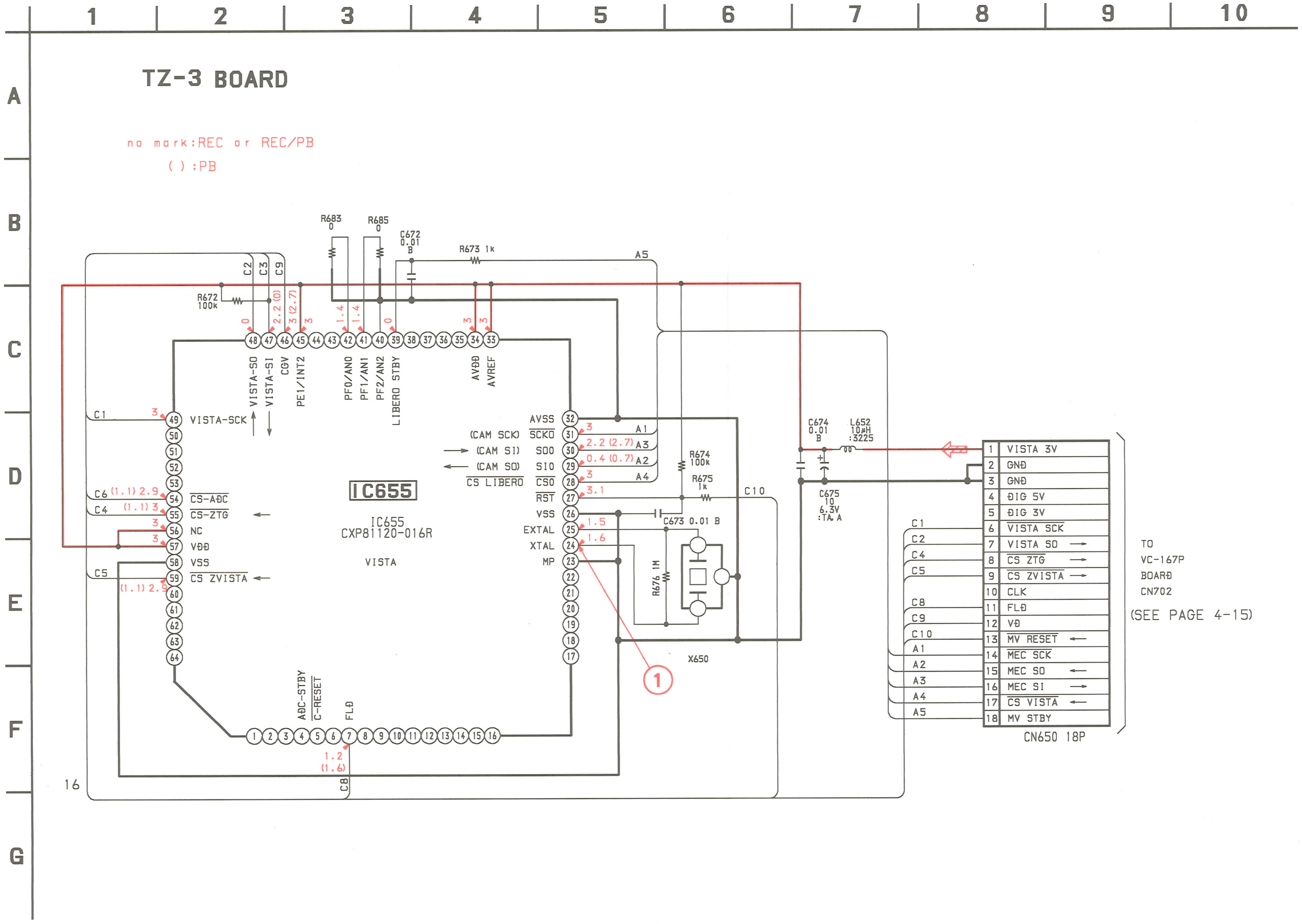

DD-80P
(POWER)
VF-94P
(RGB DECODER)
VC-167P
(MAIN)
FP-249
(MODE SENSOR)
JK-129
(JACK)
LB-44
(BACK LIGHT)
VF-93P
(EXTERNAL LIGHT SENSOR)
TZ-3
(VISTA)
CD-139
(CCD IMAGER)
PW-108
(POWER SWITCH)
CF-40
(SYSTEM CONTROL)
MA-238
(AUDIO)

There are few cases that the part printed on this diagram isn't mounted in this model.

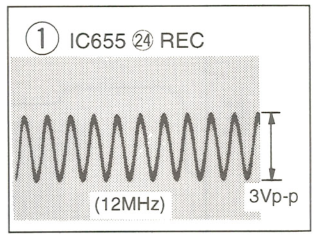

TZ-3 BOARD (SIDE A)
A
B
C
D
E
C661
CN650
18
1
C654
C655
SE651
SE650
C660
R671
IC657
TZ-3
48
33
49
32
IC655
R674
R676
X650
①
64
17
1
16
1-658-361
11
TZ-3 BOARD (SIDE B)
R661
C653
C656
R652
R650
C652
R654
C650
C658
IC650
②
C657
R659
R655
C659
R658
C666
C665
R662
R660
R664
R668
R669
R667
IC651
IC652
IC653
R663
C651
R651
R653
L650
Q650
C668
R670
IC654
20
10
11
C669
C667
L651
C670
C671
L652
C675
C674
R675
C672
C673
R672
R684
R685
R683
R682
TZ-3
1-658-361
11
16
1
2
3
4
5
6

TZ-3 BOARD

no mark:REC or REC/PB
( ):PB


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
IC655
CXP81120-016R
VISTA
R683 0
R685 0
C672 0.01 B
R673 1k
R672 100k
C674 0.01 B
L652 10μH :3225
C675 10 6.3V :TA A
R674 100k
R675 1k
C673 0.01 B
R676 1M
X650
VISTA-SO
VISTA-SI
CGV
PE1/INT2
PF0/AN0
PF1/AN1
PF2/AN2
LIBERO STBY
AVDD
AVREF
VISTA-SCK
CS-ADC
CS-ZTG
NC
VDD
VSS
CS ZVISTA
AVSS
(CAM SCK) SCKO
(CAM SI) SOO
(CAM SO) SIO
CS LIBERO CSO
RST
VSS
EXTAL
XTAL
MP
ADC-STBY
C-RESET
FLD
1.2 (1.6)
C1
C2
C3
C4
C5
C6
C8
C9
C10
A1
A2
A3
A4
A5
16
1 VISTA 3V
2 GND
3 GND
4 DIG 5V
5 DIG 3V
6 VISTA SCK
7 VISTA SO
8 CS ZTG
9 CS ZVISTA
10 CLK
11 FLD
12 VD
13 MV RESET
14 MEC SCK
15 MEC SO
16 MEC SI
17 CS VISTA
18 MV STBY
CN650 18P
TO VC-167P BOARD CN702
(SEE PAGE 4-15)
①

TZ-3 BOARD



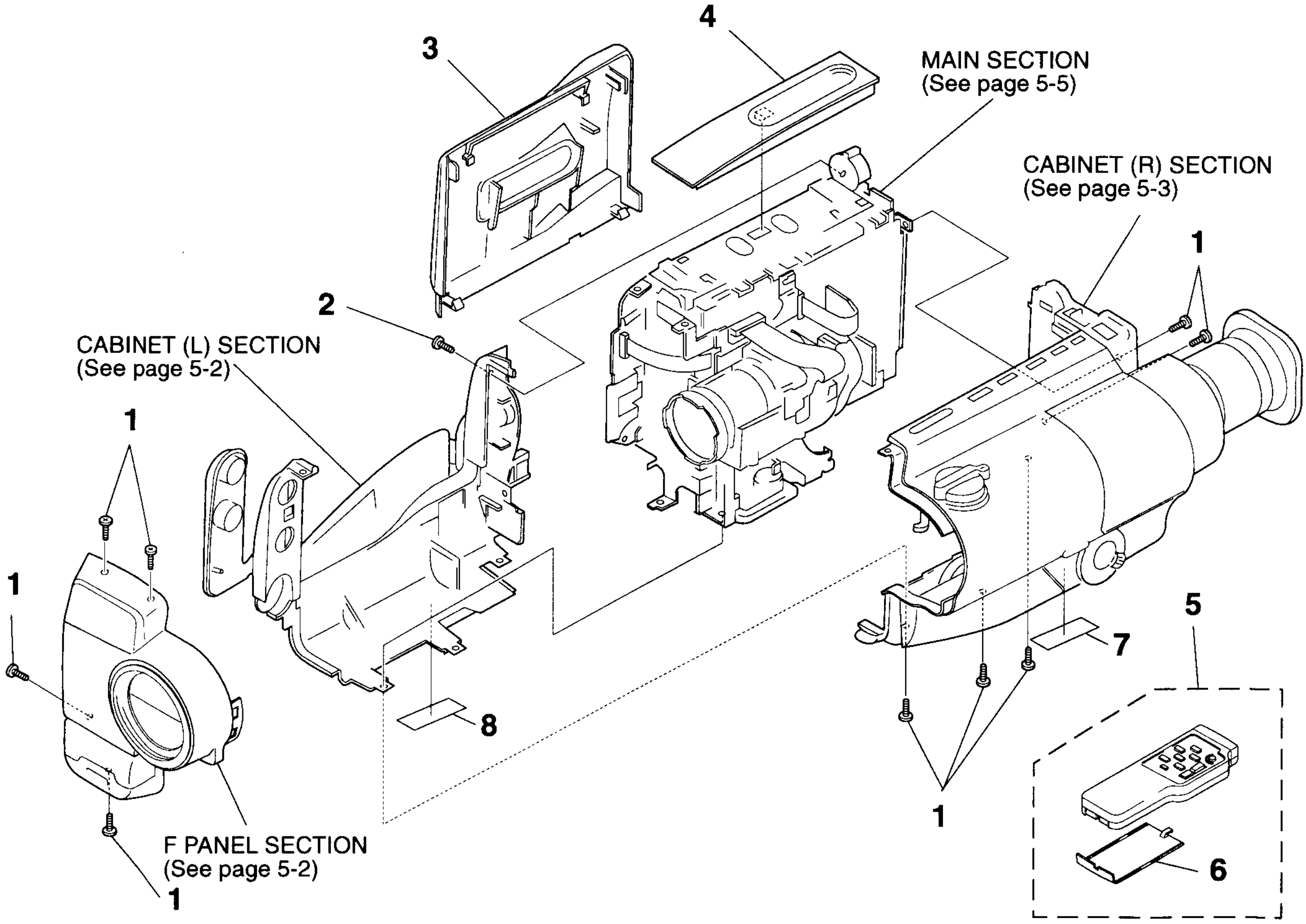
SECTION 5
REPAIR PARTS LIST

5-1. EXPLODED VIEWS

NOTE:

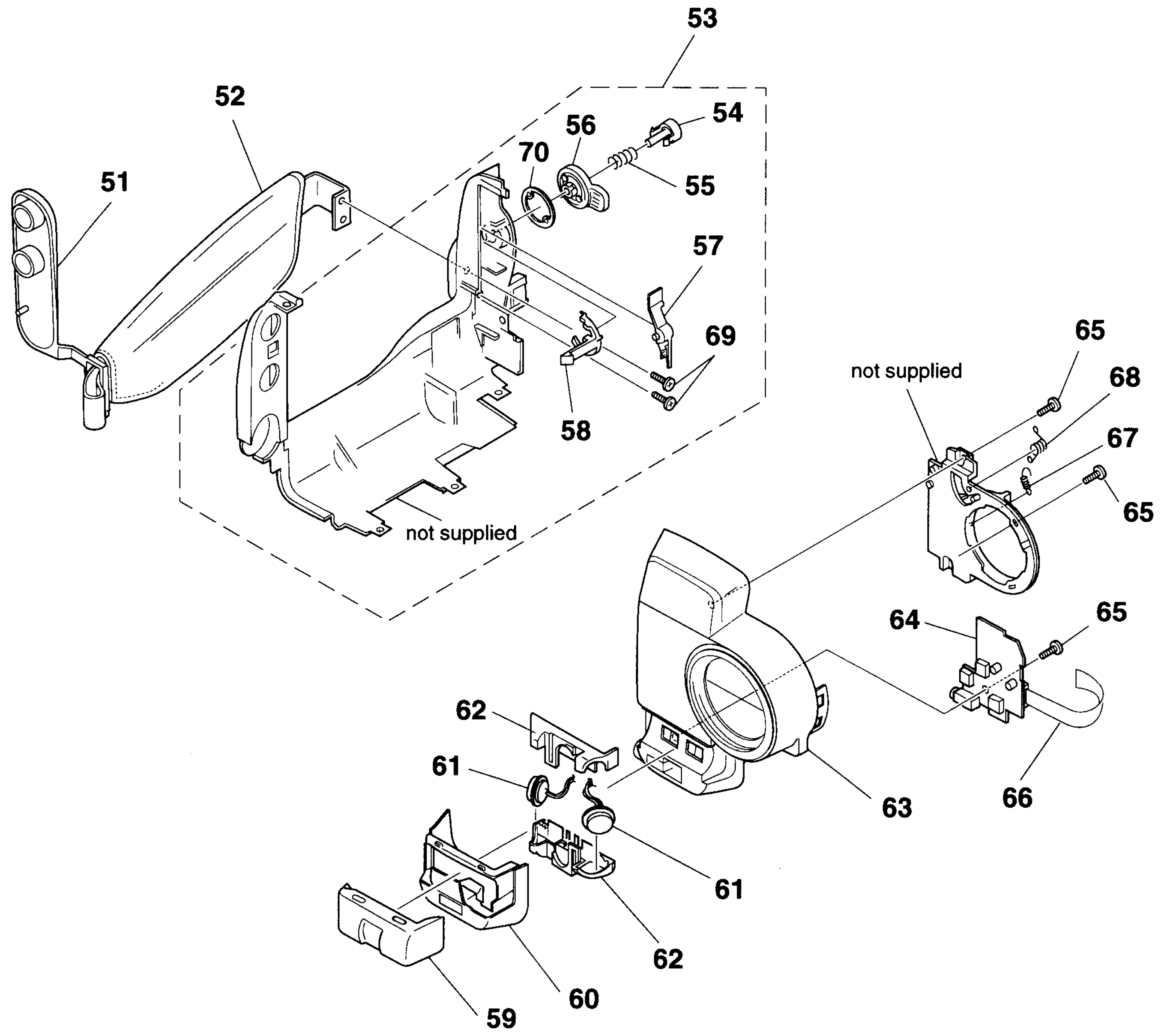
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

5-1-1. OVERALL SECTION


4
3
MAIN SECTION
(See page 5-5)
CABINET (R) SECTION
(See page 5-3)
1
2
CABINET (L) SECTION
(See page 5-2)
1
1
5
7
8
1
6
F PANEL SECTION
(See page 5-2)
1

Ref. No.	Part No.	Description	Remarks
1	3-962-826-01	SCREW (2X4)	
2	3-713-786-21	SCREW (M2X3)	
3	X-3945-446-1	LID ASSY, CASSETTE	
4	3-965-896-01	LID, LS	
5	1-473-342-11	REMOTE COMMANDER (RMT-713)	
6	3-958-131-01	COVER, BATTERY REMOCON	
7	3-969-616-01	LABEL, MODEL NUMBER (AEP)	
8	3-704-235-01	LABEL, CAUTION (UK)	

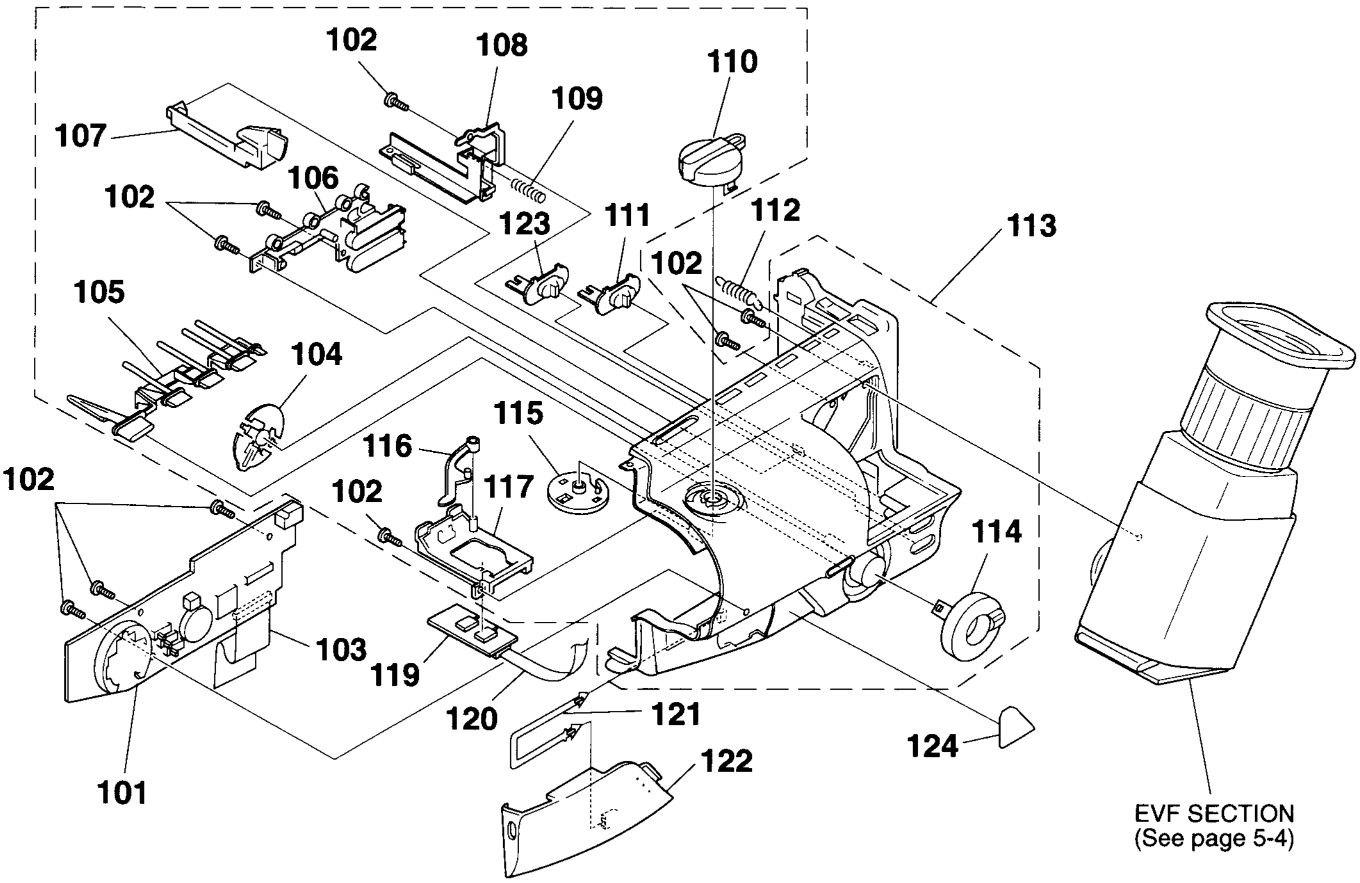
5-1-2. CABINET (L), F PANEL SECTION


53
52
56
54
70
51
55
57
69
65
not supplied
68
58
67
65
not supplied
64
65
62
61
63
66
61
62
60
59

Ref. No.	Part No.	Description	Remarks
51	3-965-888-01	COVER, JACK	
52	3-736-807-01	BELT, GRIP	
53	X-3945-896-1	CABINET (L) ASSY	
54	3-965-844-01	BUTTON, S/S	
55	3-965-830-01	SPRING, COMPRESSION	
56	3-942-985-01	KNOB, STAND-BY	
57	3-965-870-01	PLATE, S/S JOINT	
58	3-965-869-01	HOLDER, KNOB	
59	3-968-574-01	GRILLE (S), MICROPHONE	
60	X-3945-898-1	COVER ASSY, MICROPHONE	

Ref. No.	Part No.	Description	Remarks
61	1-542-259-11	MICROPHONE, CAP	
62	3-965-861-01	HOLDER, MICROPHONE	
63	X-3945-592-1	PANEL ASSY, F (AEP)	
63	X-3945-897-1	PANEL ASSY, F (E,Australian,Hong Kong)	
64	A-7072-486-A	MA-238 BOARD, COMPLETE	
65	3-719-601-01	SCREW (B2X5), TAPPING	
66	1-775-517-11	CABLE, FLEXIBLE FLAT 8P	
67	3-307-378-11	SPRING, TENSION	
68	3-967-293-01	SPRING, L COVER	
69	3-669-480-21	+ PTPWH 2	
70	3-736-364-01	SPRING	

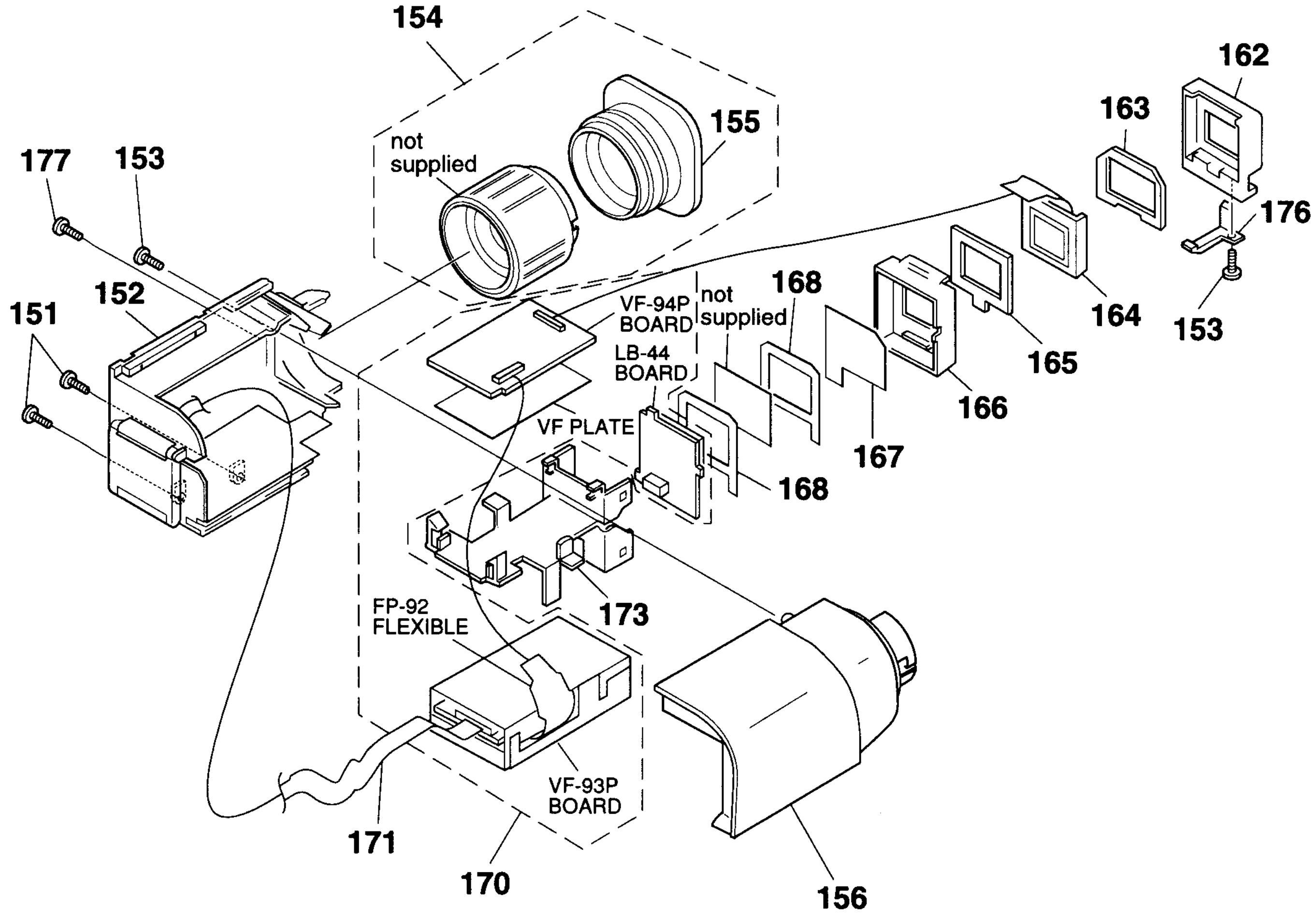
5-1-3. CABINET (R) SECTION


102
108
110
109
107
102
106
123
111
112
113
102
105
104
115
116
102
102
117
114
103
119
120
121
124
122
101
EVF SECTION
(See page 5-4)

Ref. No.	Part No.	Description	Remarks
101	A-7092-723-A	CF-40 BOARD, COMPLETE	
102	3-719-601-01	SCREW (B2X5), TAPPING	
103	1-775-520-11	CABLE, FLEXIBLE FLAT 45P	
104	3-965-867-01	RETAINER, AE DIAL	
105	3-965-894-01	BUTTON, CF	
106	3-965-895-01	HOLDER, CF BUTTON	
107	3-965-879-01	SLIDER, BT	
108	3-965-878-01	HOLDER, BT	
109	3-965-846-01	SPRING, COMPRESSION	
110	X-3945-447-1	DIAL ASSY, POWER	
111	3-965-884-01	BUTTON (3), REC MODE	
112	4-602-490-00	SPRING, TENSION	

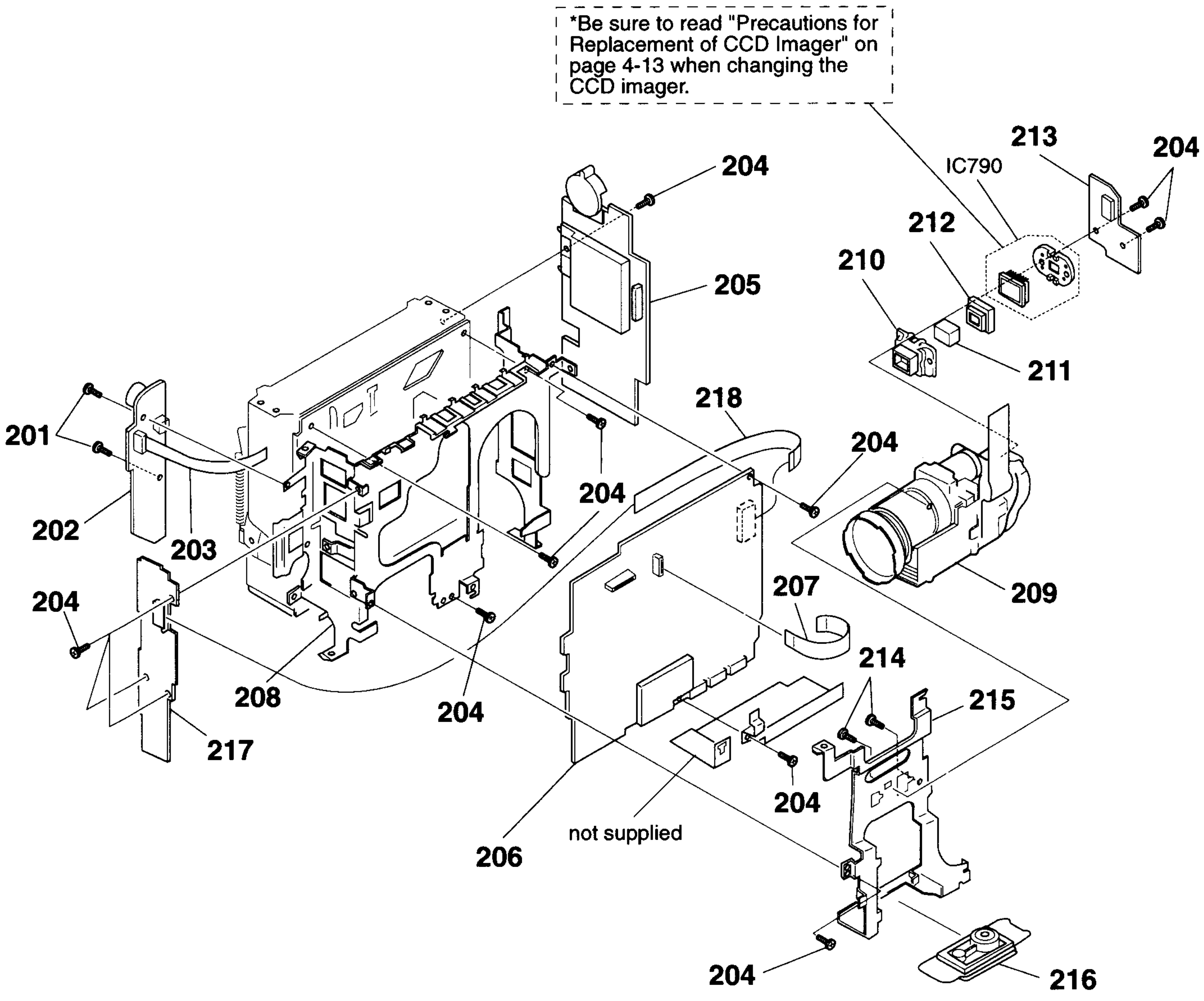
Ref. No.	Part No.	Description	Remarks
113	A-7092-724-A	CABINET (R) ASSY	
114	3-965-866-01	DIAL, AE	
115	3-965-865-01	DISK, POWER	
116	3-965-876-01	LEVER, LC	
117	3-965-877-01	HOLDER, PW	
119	A-7072-356-A	PW-108 BOARD, COMPLETE	
120	1-775-519-11	CABLE, FLEXIBLE FLAT 4P	
121	3-965-842-01	HINGE, LITHIUM LID	
122	3-965-868-01	LID, LITHIUM	
123	3-968-243-01	BUTTOM (2), HAND FORM MODE	
124	3-965-829-31	PLATE, ORNAMENTAL, SWITCH (AEP)	
124	3-965-829-51	PLATE, ORNAMENTAL, SWITCH	(E,Australian,Hong Kong)

5-1-4. EVF SECTION


154
162
163
155
177
153
not supplied
176
152
151
168
VF-94P BOARD
not supplied
164
153
165
LB-44 BOARD
166
VF PLATE
167
168
173
FP-92 FLEXIBLE
VF-93P BOARD
171
170
156

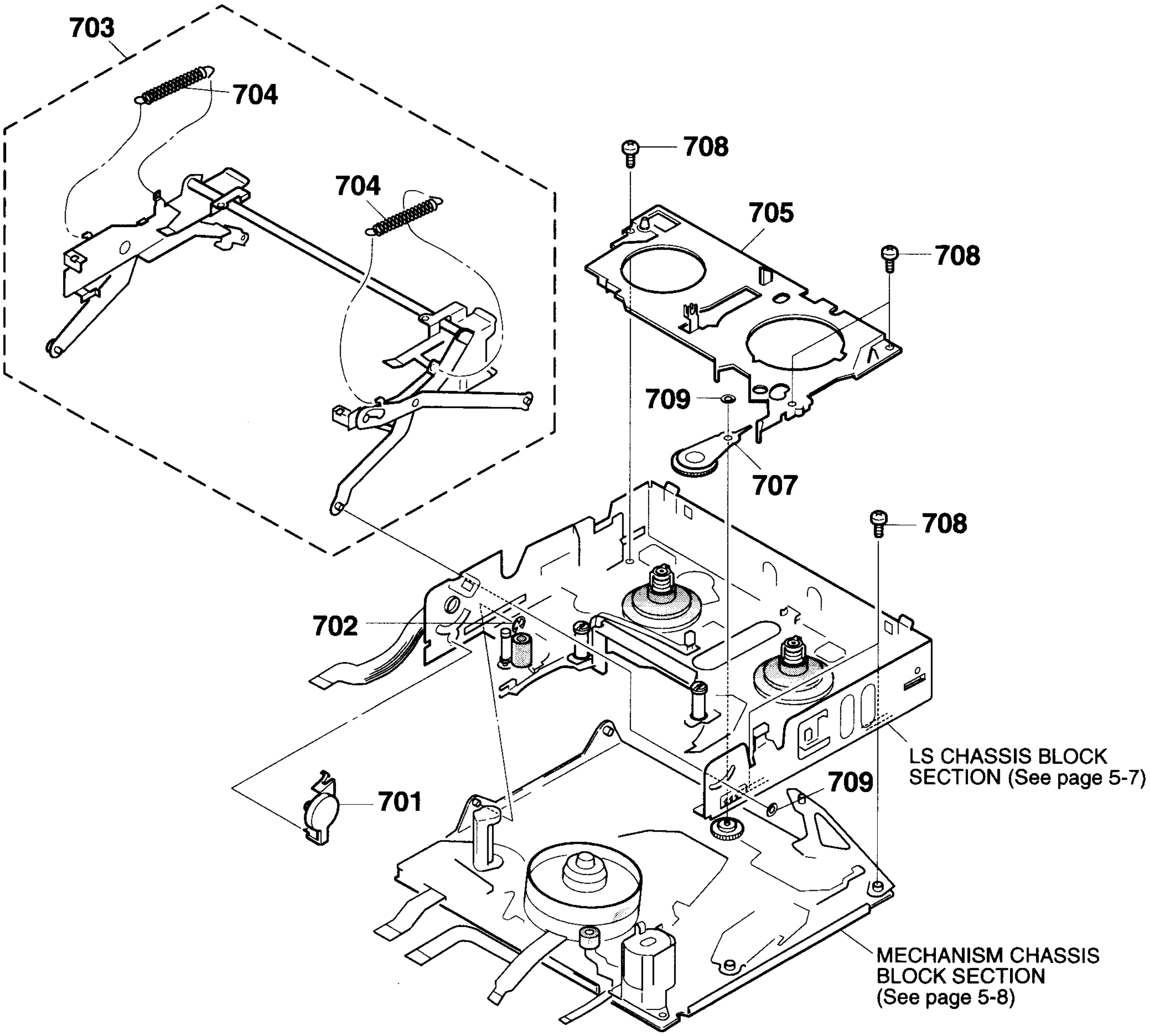
Ref. No.	Part No.	Description	Remarks
151	3-719-601-01	SCREW (B2X5), TAPPING	
152	X-3945-456-1	CABINET (L) ASSY, EVF	
153	3-948-339-01	SCREW, TAPPING	
154	X-3945-544-1	FINDER ASSY (C)	
155	3-963-160-01	EYE CUP (DM)	
156	3-965-899-01	CABINET (R), EVF	
162	3-966-394-01	COVER (C), LCD	
* 163	3-958-963-01	CUSHION (1)	
164	8-753-015-20	LCX005BK-5	
* 165	3-958-964-01	CUSHION (2)	
166	3-966-395-01	COVER, BL	
167	3-958-965-01	PLATE, CONDENCE, BL	
* 168	3-958-967-01	CUSHION (3)	
170	A-7092-689-A	COMPLETE PCB, EVF	
171	1-658-344-11	FP-282 BOARD	
173	3-966-393-01	HOLDER (C), LCD	
176	3-958-969-01	CHIP (LCD), TALLY	
177	3-966-178-01	SCREW (1.7)	

5-1-5. MAIN SECTION


*Be sure to read "Precautions for Replacement of CCD Imager" on page 4-13 when changing the CCD imager.

Ref. No.	Part No.	Description	Remarks
201	3-962-826-01	SCREW (2X4)	
202	A-7072-484-A	JK-129 BOARD, COMPLETE	
203	1-775-518-11	CABLE, FLEXIBLE FLAT 12P	
204	3-713-786-21	SCREW (M2X3)	
205	A-7072-521-A	DD-80P BOARD, COMPLETE	
206	A-7092-722-A	VC-167P BOARD, COMPLETE	
207	1-775-516-11	CABLE, FLEXIBLE FLAT 16P	
* 208	3-965-897-01	FRAME, MD	
209	1-547-739-21	LENS, ZOOM (VCL-5412WB)	
210	3-946-856-01	ADAPTOR (H), CCD FITTING	
211	1-547-558-21	FILTER BLOCK, OPTICAL	
212	3-946-857-01	RUBBER (S), SEAL	
213	A-7072-354-A	CD-139 BOARD, COMPLETE	
214	3-947-268-01	2, +B TAPPING P TAIT	
* 215	3-965-898-01	FRAME, LENS	
216	3-965-871-01	SCREW (for TRIPOD)	
217	A-7072-469-A	TZ-3 BOARD, COMPLETE	
218	1-775-833-11	CABLE, FLEXIBLE FLAT 18P	
IC790	A-7030-369-A	CCD BLOCK ASSY (ICX055AK-11) (CCD IMAGER)	

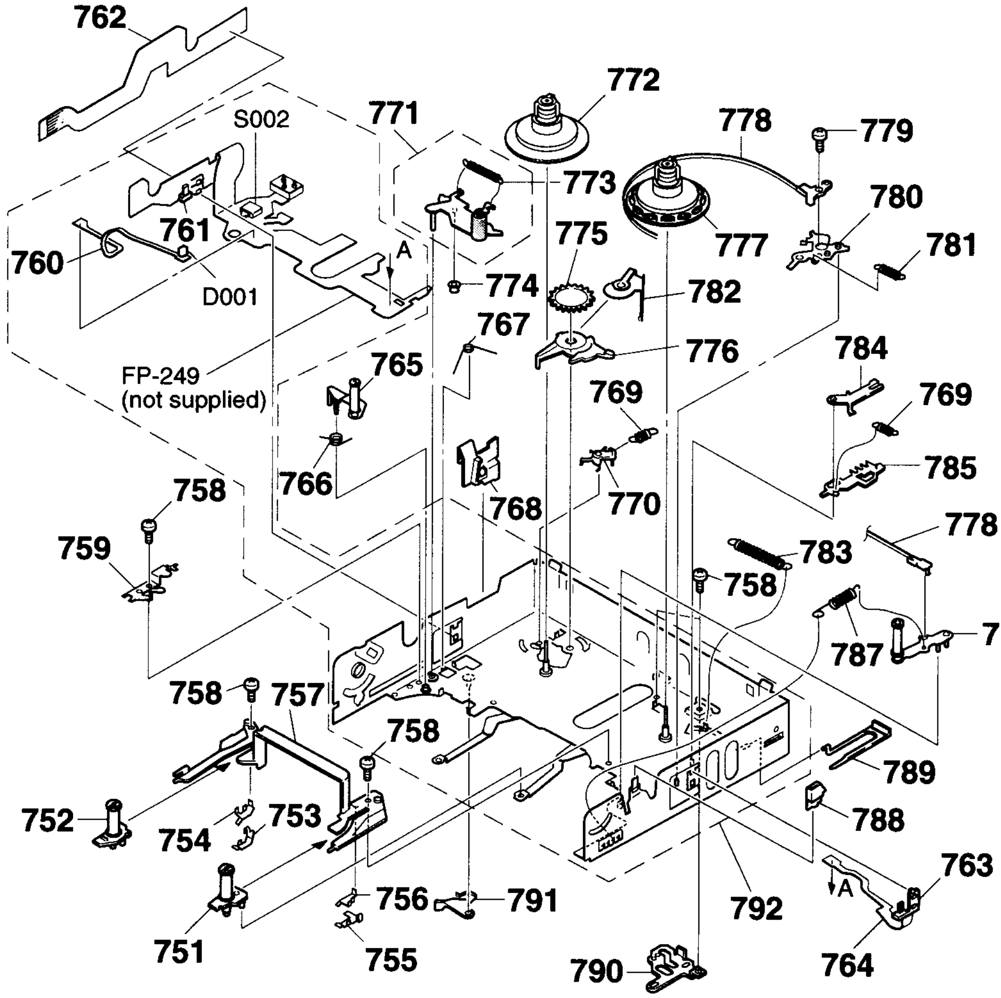
5-1-6. CASSETTE COMPARTMENT BLOCK SECTION


703
704
704
708
705
708
709
707
708
702
LS CHASSIS BLOCK SECTION (See page 5-7)
709
701
MECHANISM CHASSIS BLOCK SECTION (See page 5-8)

Ref. No.	Part No.	Description	Remarks
701	A-7040-421-A	DAMPER ASSY	
702	7-624-102-04	STOP RING 1.5, TYPE -E	
703	X-3945-400-1	CASSETTE COMPARTMENT ASSY	
704	3-965-587-01	SPRING, TENSION	

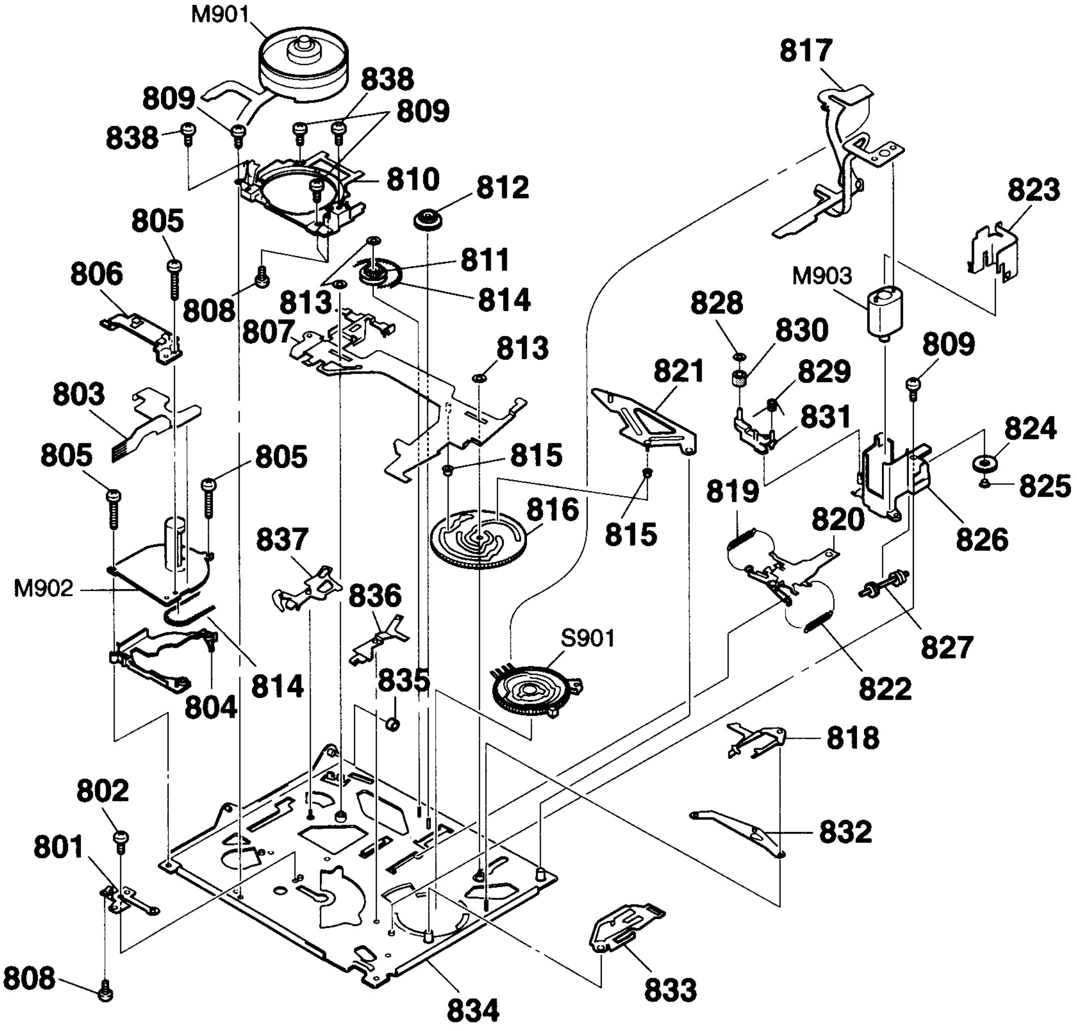
Ref. No.	Part No.	Description	Remarks
705	3-965-584-01	RETAINER, GOOSENECK	
707	X-3945-399-1	GEAR ASSY, GOOSENECK	
708	3-947-503-01	SCREW (M1.4X2.5)	
709	3-331-007-21	WASHER	

5-1-7. LS CHASSIS BLOCK SECTION


762
772
S002
771
778
779
773
780
761
760
D001
A
775
777
781
774
782
767
776
784
FP-249
(not supplied)
765
769
769
758
766
768
770
785
778
759
783
758
786
787
758
757
758
789
752
753
754
788
763
A
756
791
792
751
755
790
764

Ref. No.	Part No.	Description	Remarks
751	A-7040-419-A	BASE (S) BLOCK ASSY, GUIDE	
752	A-7040-418-A	BASE (T) BLOCK ASSY, GUIDE	
753	3-965-559-01	STOPPER (T)	
754	3-965-557-01	STOPPER (T), GB	
755	3-965-558-01	STOPPER (S)	
756	3-965-556-01	STOPPER (S), GB	
757	3-965-553-01	RAIL, GUIDE	
758	3-947-503-01	SCREW (M1.4X2.5)	
759	3-965-573-01	RETAINER, TG4	
760	1-658-213-11	FP-355 FLEXIBLE BOARD	
761	3-965-552-01	HOLDER (T), SENSOR	
762	1-657-786-11	FP-221 FLEXIBLE BOARD	
763	3-965-551-01	HOLDER (S), SENSOR	
764	1-658-214-11	FP-356 FLEXIBLE BOARD	
765	A-7040-417-A	ARM BLOCK ASSY, TG4	
766	3-965-574-01	SPRING, TORSION	
767	3-965-575-01	SPRING (PINCH), TORSION	
768	3-965-568-01	GUIDE, LOCK	
769	3-965-562-01	SPRING (RATCHET), TENSION	
770	3-965-581-01	RATCHET, T	
771	X-3945-394-1	ARM ASSY, PINCH	
772	X-3945-398-1	DECK ASSY, REEL, T	
773	3-965-648-01	SPRING (PINCH), TENSION	
774	3-965-579-01	ROLLER, PINCH PRESS	
775	3-965-563-01	GEAR, T SOFT	
776	3-965-565-01	CLAW, T SOFT	
777	X-3945-397-1	DECK ASSY, REEL, S	
778	X-3945-396-1	BAND ASSY, TENSION REGULATOR	
779	3-945-756-01	SCREW (M1.4X3)	
780	3-965-583-01	ARM, RVS	
781	3-965-580-01	SPRING, TENSION	
782	3-966-384-01	SPRING, T SOFT	
783	3-965-578-01	SPRING, TENSION	
784	3-965-560-01	RATCHET, S	
785	3-965-561-01	PLATE, RELEASE, S RATCHET	
786	X-3945-395-1	ARM ASSY, TG1	
787	3-965-576-01	SPRING (TG1), TENSION	
788	3-965-567-01	LID OPEN	
789	3-965-566-01	COVER, LS GUIDE	
* 790	3-965-577-01	PLATE, CAM, LS	
791	3-965-569-01	ARM, EJ	
792	A-7040-427-A	CHASSIS (S1) ASSY, LS	
D001	8-719-988-42	DIODE GL453S	
S002	1-572-688-11	SWITCH, PUSH (1 KEY) (C.C.LOCK)	

5-1-8. MECHANISM CHASSIS BLOCK SECTION


M901
817
838
809
809
838
810
812
823
805
806
811
808
813
814
M903
828
830
807
813
809
821
829
803
831
824
805
805
815
825
819
816
820
815
826
837
M902
836
S901
827
835
814
804
822
818
802
832
801
808
833
834

Ref. No.	Part No.	Description	Remarks
801	3-965-525-01	GROUND, SHAFT	
802	3-965-550-01	SCREW (M1.7X1.4)	
803	1-657-785-11	FP-248 FLEXIBLE BOARD	
804	3-965-545-01	SPACER, CAPSTAN	
805	3-965-549-01	SCREW (M1.4 X 6.5)	
806	3-966-349-01	HOLDER, FLEXIBLE	
807	X-3945-387-1	SLIDER ASSY, M	
808	3-965-588-01	SCREW (M1.4)	
809	3-947-503-01	SCREW (M1.4X2.5)	
810	A-7040-416-A	BASE BLOCK ASSY, DRUM	
811	3-965-527-01	GEAR, CHANGE	
812	3-965-544-01	GEAR, RELAY	
813	3-331-007-21	WASHER	
814	3-965-546-01	BELT, TIMING	
815	3-965-533-01	ROLLER, LS	
816	3-965-528-01	GEAR, CAM	
817	1-657-784-11	FP-220 FLEXIBLE BOARD	
818	3-965-529-01	PLATE, REGULATOR, TENSION	
819	3-965-536-01	SPRING, TENSION (BLACK)	
820	X-3945-388-1	SLIDER ASSY, GL	
821	3-965-532-01	ARM, LS	
822	3-965-535-01	SPRING, TENSION (SILVER)	
823	3-965-542-01	SHIELD, MOTOR	
824	3-965-539-01	GEAR (A)	
825	3-965-538-01	SLEEVE, MOTOR HOLDER	
826	3-965-540-01	HOLDER, MOTOR	
827	3-965-541-01	SHAFT, WORM	
828	3-321-393-01	WASHER, STOPPER	
829	3-965-724-01	SPRING, TORSION	
830	A-7040-423-A	ROLLER BLOCK ASSY, HC	
831	X-3945-407-1	ARM ASSY, HC ROLLER	
832	3-965-531-01	ARM, GL	
833	3-965-530-01	PLATE (2), REGULATOR, TENSION	
834	X-3945-386-1	CHASSIS ASSY, MECHANICAL	
835	3-965-526-01	ROLLER, LS GUIDE	
836	3-965-547-01	ARM, HC DRIVING	
837	3-965-534-01	PLATE, PRESS, PINCH	
838	3-966-819-01	SCREW +P1.4X3	
M901	A-7048-806-A	DRUM BLOCK ASSY (DGH-0C2A-R)	
M902	8-835-531-01	MOTOR, DC SCE-0601A (CAPSTAN)	
M903	X-3945-401-1	MOTOR ASSY, DC (LOADING)	
S901	1-762-436-11	SWITCH, ROTARY (ENCODER)	

5-2. ELECTRICAL PARTS LIST

NOTE:

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: μF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...

Ref. No.	Part No.	Description			Remarks
	A-7072-354-A	CD-139 BOARD, COMPLETE **********************			
					(Ref.No.2,000 Series)
		< CAPACITOR >			
C790	1-126-603-11	ELECT CHIP	4.7uF	20%	35V
C791	1-164-346-11	CERAMIC CHIP	1uF		16V
C792	1-126-607-11	ELECT CHIP	47uF	20%	4V
C793	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C794	1-126-603-11	ELECT CHIP	4.7uF	20%	35V
C795	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
		< CONNECTOR >			
CN790	1-691-354-21	CONNECTOR, FFC/FPC (ZIF) 16P			
		< IC >			
IC790	A-7030-369-A	CCD BLOCK ASSY (ICX055AK-11) (CCD IMAGER)			
		< COIL >			
L790	1-412-963-11	INDUCTOR 100uH			
		< TRANSISTOR >			
Q790	8-729-117-73	TRANSISTOR 2SC4178-F14			
Q791	8-729-232-86	TRANSISTOR 2SK1875			
		< RESISTOR >			
R791	1-216-839-11	METAL CHIP	33K	5%	1/16W
R792	1-216-819-11	METAL CHIP	680	5%	1/16W
R793	1-216-849-11	METAL CHIP	220K	5%	1/16W
R794	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R795	1-216-809-11	METAL CHIP	100	5%	1/16W
R796	1-216-833-11	METAL CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
	A-7092-723-A	CF-40 BOARD, COMPLETE *********************			
					(Ref.No.2,000 Series)
	3-831-441-XX	CUSHION (5)			
		< BUZZER >			
BU480	1-529-107-11	BUZZER, PIEZOELECTRIC			
		< CAPACITOR >			
C300	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C301	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C302	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C303	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C304	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C305	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C306	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C308	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C310	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C311	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C312	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C313	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C314	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C315	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C316	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C317	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C318	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C319	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C320	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C321	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C323	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C325	1-104-850-11	TANTAL. CHIP	6.8uF	20%	10V
C326	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C327	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C328	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C336	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V

CF-40

Ref. No.	Part No.	Description	Remarks
		< CONNECTOR >	
CN480	1-774-054-21	CONNECTOR, FFC/FPC (ZIF) 45P	
CN481	1-691-346-11	CONNECTOR, FFC/FPC (ZIF) 8P	
CN482	1-764-703-11	CONNECTOR, FFC/FPC (LIF) 4P	
		< DIODE >	
D300	8-719-404-49	DIODE MA111	
D301	8-719-027-50	DIODE MA142WK	
D303	8-719-420-14	DIODE MA8082-M	
D304	8-719-420-14	DIODE MA8082-M	
D309	8-719-039-XX	DIODE UMZ8.2T-T106	
D310	8-719-039-XX	DIODE UMZ8.2T-T106	
D312	8-719-420-14	DIODE MA8082-M	
D314	8-719-404-49	DIODE MA111	
D315	8-719-404-49	DIODE MA111	
⚠D316	8-719-421-27	DIODE MA728	
D317	8-719-404-49	DIODE MA111	
D318	8-719-404-49	DIODE MA111	
D321	8-719-420-14	DIODE MA8082-M	
D323	8-719-404-49	DIODE MA111	
D324	8-719-420-14	DIODE MA8082-M	
D325	8-719-420-14	DIODE MA8082-M	
D326	8-719-420-14	DIODE MA8082-M	
D327	8-719-420-14	DIODE MA8082-M	
D328	8-719-420-14	DIODE MA8082-M	
D480	8-719-951-20	LED BR1102W	
		< FILTER >	
FL300	1-411-527-21	COIL, OSC	
		< HOLDER >	
HL480	1-550-104-11	HOLDER, BATTERY	
		< IC >	
IC301	8-759-298-10	IC S-8423NFS-T2	
IC302	8-759-059-05	IC TL1596CPW	
IC303	8-759-364-02	IC MB89082PFV-G-105-BND	
		< JACK >	
J480	1-565-276-21	JACK, ULTRA SMALL 1P (LANC)	
J481	1-569-809-11	JACK (SMALL TYPE)(HEADPHONE)	
		< COIL >	
L300	1-414-078-11	INDUCTOR 10uH	
		< IC LINK >	
⚠PS301	1-576-122-21	LINK, IC	

Ref. No.	Part No.	Description	Remarks
		< TRANSISTOR >	
Q301	8-729-823-16	TRANSISTOR 2SC4555-5.6.7	
Q302	8-729-032-00	TRANSISTOR 2SJ381-TD	
Q303	8-729-402-81	TRANSISTOR XN4501	
Q304	8-729-015-76	TRANSISTOR UN5211-TX	
Q305	8-729-015-76	TRANSISTOR UN5211-TX	
		< RESISTOR >	
R300	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R301	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R303	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R304	1-216-817-11	METAL CHIP 470 5% 1/16W	
R305	1-216-864-11	METAL CHIP 0 5% 1/16W	
R306	1-216-801-11	METAL CHIP 22 5% 1/16W	
R307	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R308	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R309	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R310	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R311	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R312	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R313	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R314	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R315	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R316	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R317	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R318	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R319	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R320	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R321	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R322	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R323	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R324	1-216-864-11	METAL CHIP 0 5% 1/16W	
R325	1-216-864-11	METAL CHIP 0 5% 1/16W	
R326	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R327	1-216-864-11	METAL CHIP 0 5% 1/16W	
R331	1-216-864-11	METAL CHIP 0 5% 1/16W	
R333	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R334	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R335	1-216-817-11	METAL CHIP 470 5% 1/16W	
R336	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R337	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R338	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R339	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R340	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R341	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R342	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R343	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R345	1-216-833-11	METAL CHIP 10K 5% 1/16W	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
R346	1-216-821-11	METAL CHIP	1K	5%	1/16W
R347	1-216-821-11	METAL CHIP	1K	5%	1/16W
R348	1-216-821-11	METAL CHIP	1K	5%	1/16W
R350	1-216-833-11	METAL CHIP	10K	5%	1/16W
R351	1-216-821-11	METAL CHIP	1K	5%	1/16W
R352	1-216-821-11	METAL CHIP	1K	5%	1/16W
R353	1-216-864-11	METAL CHIP	0	5%	1/16W
R354	1-216-864-11	METAL CHIP	0	5%	1/16W
R355	1-216-864-11	METAL CHIP	0	5%	1/16W
R356	1-216-864-11	METAL CHIP	0	5%	1/16W
R357	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R358	1-216-864-11	METAL CHIP	0	5%	1/16W
R359	1-216-805-11	METAL CHIP	47	5%	1/16W
R362	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R363	1-216-821-11	METAL CHIP	1K	5%	1/16W
R364	1-216-864-11	METAL CHIP	0	5%	1/16W
R365	1-216-864-11	METAL CHIP	0	5%	1/16W
R370	1-216-864-11	METAL CHIP	0	5%	1/16W
R371	1-216-864-11	METAL CHIP	0	5%	1/16W
R372	1-216-864-11	METAL CHIP	0	5%	1/16W
R373	1-216-821-11	METAL CHIP	1K	5%	1/16W
R374	1-216-821-11	METAL CHIP	1K	5%	1/16W
R375	1-216-853-11	METAL CHIP	470K	5%	1/16W
R376	1-216-821-11	METAL CHIP	1K	5%	1/16W
R377	1-216-821-11	METAL CHIP	1K	5%	1/16W
R378	1-216-821-11	METAL CHIP	1K	5%	1/16W
R379	1-216-821-11	METAL CHIP	1K	5%	1/16W
R380	1-216-821-11	METAL CHIP	1K	5%	1/16W
R381	1-216-821-11	METAL CHIP	1K	5%	1/16W
R384	1-216-833-11	METAL CHIP	10K	5%	1/16W
R386	1-216-833-11	METAL CHIP	10K	5%	1/16W
R387	1-216-833-11	METAL CHIP	10K	5%	1/16W
R389	1-216-849-11	METAL CHIP	220K	5%	1/16W
R390	1-216-849-11	METAL CHIP	220K	5%	1/16W
R392	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R393	1-216-809-11	METAL CHIP	100	5%	1/16W
R394	1-218-290-11	METAL GLAZE	6.2K	5%	1/16W
R395	1-216-833-11	METAL CHIP	10K	5%	1/16W
R396	1-216-821-11	METAL CHIP	1K	5%	1/16W
R397	1-216-845-11	METAL CHIP	100K	5%	1/16W
R398	1-216-845-11	METAL CHIP	100K	5%	1/16W
R399	1-216-851-11	METAL CHIP	330K	5%	1/16W
R490	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R491	1-216-864-11	METAL CHIP	0	5%	1/16W
R492	1-216-864-11	METAL CHIP	0	5%	1/16W
R493	1-216-864-11	METAL CHIP	0	5%	1/16W
R494	1-216-864-11	METAL CHIP	0	5%	1/16W
R495	1-216-864-11	METAL CHIP	0	5%	1/16W
R496	1-216-797-11	METAL CHIP	10	5%	1/16W
R497	1-216-864-11	METAL CHIP	0	5%	1/16W
R499	1-216-836-11	METAL CHIP	18K	5%	1/16W

< SWITCH >

Ref. No.	Part No.	Description	Remarks
S300	1-553-977-71	SWITCH, SLIDE (D ZOOM)	
S301	1-762-333-21	SWITCH, TACTILE (TITLE)	
S480	1-762-333-21	SWITCH, TACTILE (DATE(+))	
S481	1-762-333-21	SWITCH, TACTILE (TIME(NEXT))	
S482	1-762-333-21	SWITCH, TACTILE (COUNTER RESET)	
S483	1-553-977-71	SWITCH, SLIDE (REC MODE)	
S484	1-762-333-21	SWITCH, TACTILE (BACK LIGHT)	
S485	1-570-113-11	SWITCH, SLIDE (START/STOP MODE)	
S486	1-570-113-11	SWITCH, SLIDE (WIDE TV)	
S487	1-553-977-71	SWITCH, SLIDE (COMMANDER)	
S488	1-553-977-71	SWITCH, SLIDE (BEEP)	
S489	1-762-442-21	SWITCH, ROTARY (PROGRAM AE)	

< VIBRATOR >

X302	1-579-463-11	VIBRATOR, CRYSTAL 32KHz
XTL301	1-579-369-21	VIBRATOR 10MHz

A-7072-521-A DD-80P BOARD, COMPLETE
****

(Ref.No.1,000 Series)

< CAPACITOR >

C001	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C002	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C003	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C004	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C005	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C006	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C007	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C008	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C009	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V
C010	1-128-004-11	ELECT CHIP	10uF	20%	16V
C011	1-128-004-11	ELECT CHIP	10uF	20%	16V
C012	1-128-004-11	ELECT CHIP	10uF	20%	16V
C013	1-128-065-11	ELECT	68uF	20%	10V
C014	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C016	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C018	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C019	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C022	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C023	1-128-004-11	ELECT CHIP	10uF	20%	16V
C024	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C025	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C026	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C027	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C028	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C029	1-165-178-11	CERAMIC CHIP	6.8uF		16V

Ref. No.	Part No.	Description			Remarks
C030	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C031	1-115-170-11	TANTALUM	4.7uF	20%	10V
C032	1-115-170-11	TANTALUM	4.7uF	20%	10V
C033	1-115-169-11	TANTALUM	10uF	20%	6.3V
C034	1-115-170-11	TANTALUM	4.7uF	20%	10V
C035	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C036	1-115-169-11	TANTALUM	10uF	20%	6.3V
C037	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C038	1-128-004-11	ELECT CHIP	10uF	20%	16V
C039	1-128-004-11	ELECT CHIP	10uF	20%	16V
C040	1-128-004-11	ELECT CHIP	10uF	20%	16V
C041	1-128-004-11	ELECT CHIP	10uF	20%	16V
C042	1-128-004-11	ELECT CHIP	10uF	20%	16V
C043	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C044	1-128-004-11	ELECT CHIP	10uF	20%	16V
C045	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C046	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C047	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C048	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
		< CONNECTOR >			
* CN003	1-691-935-11	CONNECTOR, BOARD TO BOARD 38P			
		< DIODE >			
D001	8-719-989-33	DIODE FC806			
D002	8-719-420-14	DIODE MA8082-M			
		< IC >			
IC001	8-759-350-29	IC SN104213PM-T6			
		< JACK >			
J001	1-537-241-11	TERMINAL BOARD (BATTERY)			
		< COIL >			
L001	1-411-460-21	COEL, CHOKE 10uH			
L002	1-411-460-21	COEL, CHOKE 10uH			
L003	1-411-460-21	COEL, CHOKE 10uH			
L004	1-411-460-21	COEL, CHOKE 10uH			
L005	1-409-533-11	COIL, CHOKE 47uH			
L006	1-409-533-11	COIL, CHOKE 47uH			
L007	1-409-531-11	COIL, CHOKE 22uH			
L008	1-409-533-11	COIL, CHOKE 47uH			
L009	1-409-531-11	COIL, CHOKE 22uH			
L010	1-412-056-11	INDUCTOR CHIP 4.7uH			
L011	1-412-056-11	INDUCTOR CHIP 4.7uH			
L012	1-412-056-11	INDUCTOR CHIP 4.7uH			
L013	1-412-056-11	INDUCTOR CHIP 4.7uH			
L014	1-412-064-11	INDUCTOR CHIP 100uH			
L015	1-412-064-11	INDUCTOR CHIP 100uH			

Ref. No.	Part No.	Description			Remarks
L016	1-412-056-11	INDUCTOR CHIP 4.7uH			
L017	1-412-056-11	INDUCTOR CHIP 4.7uH			
L018	1-412-056-11	INDUCTOR CHIP 4.7uH			
		< IC LINK >			
⚠PS002	1-533-284-11	LINK, CHIP IC			
⚠PS003	1-533-284-11	LINK, CHIP IC			
⚠PS004	1-533-284-11	LINK, CHIP IC			
		< TRANSISTOR >			
Q001	8-729-033-14	TRANSISTOR FP107-TL			
Q002	8-729-033-14	TRANSISTOR FP107-TL			
Q003	8-729-804-41	TRANSISTOR 2SB1122-S			
Q004	8-729-033-14	TRANSISTOR FP107-TL			
Q005	8-729-033-14	TRANSISTOR FP107-TL			
Q006	8-729-033-14	TRANSISTOR FP107-TL			
Q007	8-729-030-75	TRANSISTOR 2SK2316-TD			
Q008	8-729-402-42	TRANSISTOR UN5213			
		< RESISTOR >			
R001	1-216-841-11	METAL CHIP	47K	5%	1/16W
R002	1-216-835-11	METAL CHIP	15K	5%	1/16W
R003	1-216-837-11	METAL CHIP	22K	5%	1/16W
R004	1-216-835-11	METAL CHIP	15K	5%	1/16W
R005	1-216-839-11	METAL CHIP	33K	5%	1/16W
R006	1-216-837-11	METAL CHIP	22K	5%	1/16W
R007	1-216-821-11	METAL CHIP	1K	5%	1/16W
R008	1-216-813-11	METAL CHIP	220	5%	1/16W
R009	1-216-841-11	METAL CHIP	47K	5%	1/16W
R010	1-216-845-11	METAL CHIP	100K	5%	1/16W
R014	1-216-821-11	METAL CHIP	1K	5%	1/16W
R015	1-216-819-11	METAL CHIP	680	5%	1/16W
R016	1-216-864-11	METAL CHIP	0	5%	1/16W
R017	1-216-833-11	METAL CHIP	10K	5%	1/16W
R018	1-216-833-11	METAL CHIP	10K	5%	1/16W
R019	1-216-833-11	METAL CHIP	10K	5%	1/16W
R020	1-216-835-11	METAL CHIP	15K	5%	1/16W
R021	1-216-839-11	METAL CHIP	33K	5%	1/16W
R022	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R023	1-216-797-11	METAL CHIP	10	5%	1/16W
R024	1-216-837-11	METAL CHIP	22K	5%	1/16W
R025	1-216-841-11	METAL CHIP	47K	5%	1/16W
R027	1-216-833-11	METAL CHIP	10K	5%	1/16W
R033	1-216-833-11	METAL CHIP	10K	5%	1/16W
		< SWITCH >			
S001	1-572-688-11	SWITCH, PUSH (1 KEY)(START/STOP)			
S002	1-572-467-21	SWITCH, PUSH (1 KEY)(EJECT)			
S003	1-762-441-11	SWITCH, ROTARY (ZOOM SW)			
S004	1-572-688-11	SWITCH, PUSH (1 KEY)(STANDBY)			

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

< TRANSFORMER >

Ref. No.	Part No.	Description	Remarks
T001	1-429-225-21	TRANSFORMER, DC/DC CONVERTER	

FP-249 BOARD
****

(Ref.No.5,000 Series)

Ref. No.	Part No.	Description	Remarks
	1-658-214-11	FP-356 FLEXIBLE BOARD	
	3-965-551-01	HOLDER (S), SENSOR	
	3-965-552-01	HOLDER (T), SENSOR	

< HOLE ELEMENT >

Ref. No.	Part No.	Description	Remarks
H001	8-719-033-37	ELEMENT, HALL HW-105C	
H002	8-719-033-37	ELEMENT, HALL HW-105C	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remarks
Q001	8-729-907-25	PHOTO TRANSISTOR PT4850F	
Q002	8-729-907-25	PHOTO TRANSISTOR PT4850F	

< SWITCH >

Ref. No.	Part No.	Description	Remarks
S001	1-692-614-11	SWITCH, PUSH (3 KEY) (REC PROOF)	
S002	1-572-688-11	SWITCH, PUSH (1 KEY) (C.C.LOCK)	

A-7072-484-A JK-129 BOARD, COMPLETE
****

(Ref.No.2,000 Series)

< CONNECTOR >

Ref. No.	Part No.	Description	Remarks
* CN060	1-764-521-11	CONNECTOR, FFC/FPC (ZIF) 12P	

< DIODE >

Ref. No.	Part No.	Description	Remarks
D060	8-719-027-50	DIODE MA142WK	
D061	8-719-404-49	DIODE MA111	
D062	8-719-039-XX	DIODE UMZ8.2T-T106	
D063	8-719-039-XX	DIODE UMZ8.2T-T106	
D069	8-719-039-XX	DIODE UMZ8.2T-T106	

< JACK >

Ref. No.	Part No.	Description	Remarks
J060	1-537-747-11	TERMINAL BOARD (VIDEO/AUDIO OUT)	

A-7072-400-A LB-44 BOARD, COMPLETE
****

(Ref.No.4,000 Series)

< FLUORESCENT TUBE >

Ref. No.	Part No.	Description	Remarks
BL801	1-517-414-21	FLUORESCENT TUBE (0.55 INCH)	

< CONNECTOR >

Ref. No.	Part No.	Description	Remarks
CN801	1-573-812-11	CONNECTOR, BOARD TO BOARD 12P	

A-7072-486-A MA-238 BOARD, COMPLETE
****

(Ref.No.2,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description			Remarks
C953	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C954	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C955	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C957	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C958	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C959	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C960	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C961	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C962	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C963	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C964	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C969	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C970	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C972	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C973	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C974	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C975	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C977	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C978	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C990	1-124-779-00	ELECT CHIP	10uF	20%	16V
C993	1-124-779-00	ELECT CHIP	10uF	20%	16V
C995	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C996	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C998	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C999	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V

< CONNECTOR >

Ref. No.	Part No.	Description	Remarks
CN951	1-764-707-21	CONNECTOR, FFC/FPC (LIF) 8P	
CN952	1-580-055-21	PIN, CONNECTOR 2P	
CN953	1-580-055-21	PIN, CONNECTOR 2P	

< DIODE >

Ref. No.	Part No.	Description	Remarks
D951	8-719-404-49	DIODE MA111	
D952	8-719-404-49	DIODE MA111	

< IC >

Ref. No.	Part No.	Description	Remarks
IC951	8-759-380-80	IC LA7473V-TLM	
IC953	8-749-012-17	IC RS-140-T	

< JACK >

Ref. No.	Part No.	Description	Remarks
J951	1-691-737-11	JACK (SMALL TYPE)(MIC)	

Ref. No.	Part No.	Description	Remarks
		< COIL >	
L951	1-412-939-11	INDUCTOR 1uH	
L952	1-412-939-11	INDUCTOR 1uH	
L953	1-412-939-11	INDUCTOR 1uH	
		< RESISTOR >	
R952	1-216-864-11	METAL CHIP 0 5% 1/16W	
R954	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R957	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R958	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R959	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R961	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R962	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R963	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R964	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R965	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R967	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R968	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R969	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R970	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R972	1-216-864-11	METAL CHIP 0 5% 1/16W	
R973	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R975	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R976	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R986	1-216-864-11	METAL CHIP 0 5% 1/16W	
R989	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R990	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R991	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R992	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R993	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R995	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R996	1-216-835-11	METAL CHIP 15K 5% 1/16W	
	A-7072-356-A	PW-108 BOARD, COMPLETE **********************	
			(Ref.No.2,000 Series)
		< CONNECTOR >	
CN583	1-764-703-11	CONNECTOR, FFC/FPC (LIF) 4P	
		< SWITCH >	
S490	1-572-467-21	SWITCH, PUSH (1 KEY)(CAMERA)	
S491	1-572-467-21	SWITCH, PUSH (1 KEY)(PLAYER)	
	A-7072-469-A	TZ-3 BOARD, COMPLETE ********************	
			(Ref.No.5,000 Series)
		< CAPACITOR >	
C672	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C673	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C674	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C675	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
		< CONNECTOR >	
CN650	1-691-356-21	CONNECTOR, FFC/FPC (ZIF) 18P	
		< IC >	
IC655	8-752-867-95	IC CXP81120-016R	
		< COIL >	
L652	1-412-058-11	INDUCTOR CHIP 10uH	
		< RESISTOR >	
R672	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R673	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R674	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R675	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R676	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R683	1-216-864-11	METAL CHIP 0 5% 1/16W	
R685	1-216-864-11	METAL CHIP 0 5% 1/16W	
		< VIBRATOR >	
X650	1-579-553-11	VIBRATOR	
	A-7092-722-A	VC-167P BOARD, COMPLETE ***********************	
			(Ref.No.1,000 Series)
		< CAPACITOR >	
C061	1-104-852-11	TANTAL. CHIP 22uF 20% 6.3V	
C069	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C072	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C073	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C075	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C076	1-109-996-11	CERAMIC CHIP 1uF 6.3V	
C077	1-164-346-11	CERAMIC CHIP 1uF 16V	
C078	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C101	1-162-919-11	CERAMIC CHIP 22PF 5% 50V	
C102	1-162-919-11	CERAMIC CHIP 22PF 5% 50V	

Ref. No.	Part No.	Description			Remarks
C103	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C104	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C106	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C107	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C108	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C109	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C110	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C111	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C112	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C113	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C114	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C115	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C116	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C117	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C118	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C119	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C120	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C121	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C122	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C123	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C124	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C125	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C127	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C128	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C129	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C130	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C134	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C135	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C136	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C137	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C138	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C139	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C140	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C141	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C142	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C143	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C148	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C149	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C150	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C152	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C153	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C154	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C155	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C156	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C157	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C160	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C162	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C163	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C164	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C165	1-162-917-11	CERAMIC CHIP	15PF	5%	50V

Ref. No.	Part No.	Description			Remarks
C166	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C167	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C168	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C169	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C170	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C171	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C202	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C203	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C204	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C205	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C206	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C207	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C208	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C209	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C210	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C211	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C212	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C213	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C214	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C215	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C216	1-126-246-11	ELECT CHIP	220uF	20%	4V
C217	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C218	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C219	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C223	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C224	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C225	1-162-928-11	CERAMIC CHIP	120PF	5%	50V
C226	1-164-315-11	CERAMIC CHIP	470PF	2%	50V
C227	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C229	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C230	1-164-392-11	CERAMIC CHIP	390PF	5%	50V
C231	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C232	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C233	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C234	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C235	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C236	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C237	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C238	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C240	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C242	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C243	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C244	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C245	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C246	1-135-073-00	TANTALUM CHIP	0.33uF	10%	35V
C247	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C248	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C249	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C252	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C254	1-164-237-11	CERAMIC CHIP	16PF	5%	50V

Ref. No.	Part No.	Description			Remarks
C256	1-165-112-11	CERAMIC CHIP	0.33uF		16V
C257	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C260	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C263	1-162-920-11	CERAMIC CHIP	27PF	5%	50V
C265	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C266	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C267	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C269	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C270	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C271	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C400	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C401	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C402	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C403	1-162-912-11	CERAMIC CHIP	7PF	0.5PF	50V
C404	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C405	1-162-907-11	CERAMIC CHIP	2PF	0.25PF	50V
C406	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C407	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C408	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C409	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C411	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C412	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C413	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C414	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C415	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C416	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C417	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C418	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C419	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C420	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C421	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C423	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C424	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C425	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C426	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C427	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C428	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C429	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C430	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C431	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C432	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C433	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C434	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C435	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C436	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C437	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C438	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C439	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C441	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C442	1-165-112-11	CERAMIC CHIP	0.33uF		16V

Ref. No.	Part No.	Description			Remarks
C443	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C444	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C445	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C446	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C447	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C448	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C449	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C450	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C451	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C452	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C453	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C456	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C458	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C502	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C505	1-104-908-11	TANTAL. CHIP	47uF	20%	4V
C506	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C507	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C511	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C512	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C515	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C516	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C517	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C520	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C521	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C522	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C523	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C525	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C526	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C528	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C529	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C530	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C531	1-104-908-11	TANTAL. CHIP	47uF	20%	4V
C532	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C533	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C534	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C535	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C537	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C538	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C540	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C542	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C543	1-104-908-11	TANTAL. CHIP	47uF	20%	4V
C544	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C546	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C548	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C550	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C553	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C556	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C557	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C558	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C561	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V

Ref. No.	Part No.	Description			Remarks
C563	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C571	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C572	1-164-392-11	CERAMIC CHIP	390PF	5%	50V
C573	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C574	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C575	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C576	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C577	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C578	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C602	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C603	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C604	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C605	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C606	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C607	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C608	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C609	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C610	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C611	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C612	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C613	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C614	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C615	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C616	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C618	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C619	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C620	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C701	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C702	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C703	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C704	1-164-346-11	CERAMIC CHIP	1uF		16V
C706	1-135-214-21	TANTAL. CHIP	4.7uF	20%	20V
C707	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C708	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C710	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C711	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C712	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C713	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C714	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C715	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C717	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C718	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C719	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C720	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C722	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C724	1-162-924-11	CERAMIC CHIP	56PF	5%	50V
C725	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C726	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C727	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C728	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C729	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C730	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C731	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C732	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C734	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C735	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C736	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C739	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C740	1-164-315-11	CERAMIC CHIP	470PF	2%	50V
C741	1-135-148-21	TANTAL. CHIP	1.5uF	20%	10V
C742	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C745	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C746	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C748	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C749	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C750	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C751	1-164-346-11	CERAMIC CHIP	1uF		16V
C755	1-164-346-11	CERAMIC CHIP	1uF		16V
C757	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C758	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C759	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C760	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C761	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C772	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V

< CONNECTOR >

Ref. No.	Part No.	Description
CN060	1-691-350-21	CONNECTOR, FFC/FPC (ZIF) 12P
CN101	1-766-341-21	CONNECTOR, FFC/FPC 11P
CN102	1-764-708-21	CONNECTOR, FFC/FPC (LIF) 9P
CN300	1-774-054-21	CONNECTOR, FFC/FPC (ZIF) 45P
* CN301	1-691-931-11	CONNECTOR, BOARD TO BOARD 38P
CN400	1-766-340-21	CONNECTOR, FFC/FPC 10P
CN401	1-766-342-21	CONNECTOR, FFC/FPC 12P
CN402	1-766-345-21	CONNECTOR, FFC/FPC 15P
CN403	1-766-644-21	CONNECTOR, FFC/FPC 8P
CN501	1-764-707-21	CONNECTOR, FFC/FPC (LIF) 8P
CN601	1-764-529-11	CONNECTOR, FFC/FPC (ZIF) 22P
CN701	1-750-630-11	CONNECTOR, FFC/FPC (ZIF) 16P
CN702	1-691-356-21	CONNECTOR, FFC/FPC (ZIF) 18P

< DIODE >

Ref. No.	Part No.	Description	
D101	8-719-404-49	DIODE	MA111
D102	8-719-820-41	DIODE	1SS302
D103	8-719-027-50	DIODE	MA142WK
D201	8-719-027-50	DIODE	MA142WK
D202	8-719-404-49	DIODE	MA111
D203	8-719-027-48	DIODE	MA142WA
D302	8-719-404-49	DIODE	MA111
D319	8-719-033-13	DIODE	CL-170Y-CD-T(DEW)
D701	8-719-027-48	DIODE	MA142WA
D702	8-719-404-49	DIODE	MA111

Ref. No.	Part No.	Description	Remarks
D703	8-719-404-49	DIODE MA111	
D705	8-719-002-81	DIODE 1T363	
D706	8-713-102-28	DIODE 1T379-04-T8A	

< IC >

Ref. No.	Part No.	Description	Remarks
IC061	8-759-362-34	IC MB88344BLPFV-ER	
IC101	8-752-071-48	IC CXA2002R	
IC201	8-752-071-47	IC CXA2001R	
IC202	8-759-035-90	IC SC7S02F	
IC204	8-759-234-20	IC TC7S08F	
IC400	8-752-858-51	IC CXP87460-005R	
IC401	8-759-278-57	IC AK6420HF-E2	
IC402	8-752-070-46	IC CXA1814Q	
IC403	8-759-327-67	IC LB1950V-TLM	
IC404	8-759-327-62	IC TA8482FN-EL	
IC405	8-759-234-20	IC TC7S08F	
IC501	8-759-368-08	IC AN2980FH-EB	
IC570	8-759-334-09	IC CXA2003N-T4	
IC601	8-759-337-40	IC NJM2904V(TE2)	
IC602	8-759-337-41	IC NJM2902V(TE2)	
IC603	8-759-247-07	IC MPC17A34VMEL	
IC604	8-752-365-65	IC CXD2126N-T4	
IC701	8-752-372-14	IC CXD1267AN	
IC702	8-752-374-25	IC CXD2415R-T4	
IC703	8-752-073-11	IC CXA2006Q-T4	
IC704	8-752-375-80	IC CXD2312R	
IC705	8-752-374-02	IC CXD2418R	
IC706	8-759-349-58	IC CXD8562R	
IC707	8-759-297-76	IC CXD2152AREL	
IC708	8-759-337-40	IC NJM2904V(TE2)	
IC709	8-759-198-34	IC TA75S558F	
IC710	8-759-198-34	IC TA75S558F	

< COIL >

Ref. No.	Part No.	Description	Remarks
L061	1-412-064-11	INDUCTOR CHIP 100uH	
L062	1-414-078-11	INDUCTOR 10uH	
L063	1-412-052-21	INDUCTOR CHIP 1uH	
L101	1-412-066-21	INDUCTOR CHIP 220uH	
L102	1-412-066-21	INDUCTOR CHIP 220uH	
L103	1-412-066-21	INDUCTOR CHIP 220uH	
L104	1-412-952-11	INDUCTOR 12uH	
L105	1-412-060-11	INDUCTOR CHIP 22uH	
L106	1-412-957-11	INDUCTOR 33uH	
L107	1-412-280-31	INDUCTOR 330uH	
L108	1-412-282-41	INDUCTOR 470uH	
L109	1-412-355-41	INDUCTOR 180uH	
L113	1-414-078-11	INDUCTOR 10uH	
L114	1-412-355-41	INDUCTOR 180uH	
L115	1-412-957-11	INDUCTOR 33uH	
L116	1-414-078-11	INDUCTOR 10uH	
L118	1-414-373-31	INDUCTOR CHIP 10uH	
L118	1-414-373-61	INDUCTOR CHIP 10uH	
L119	1-412-950-11	INDUCTOR 8.2uH	
L120	1-410-658-31	INDUCTOR CHIP 220uH	
L121	1-410-655-31	INDUCTOR CHIP 120uH	
L202	1-412-064-11	INDUCTOR CHIP 100uH	
L203	1-412-962-11	INDUCTOR 82uH	
L207	1-412-962-11	INDUCTOR 82uH	
L210	1-412-951-11	INDUCTOR 10uH	
L211	1-412-058-11	INDUCTOR CHIP 10uH	
L212	1-412-058-11	INDUCTOR CHIP 10uH	
L213	1-414-196-41	INDUCTOR 47uH	
L214	1-412-056-11	INDUCTOR CHIP 4.7uH	
L215	1-412-962-11	INDUCTOR 82uH	
L216	1-412-963-11	INDUCTOR 100uH	
L400	1-412-058-11	INDUCTOR CHIP 10uH	
L401	1-412-959-11	INDUCTOR 47uH	
L570	1-414-078-11	INDUCTOR 10uH	
L601	1-412-058-11	INDUCTOR CHIP 10uH	
L602	1-412-058-11	INDUCTOR CHIP 10uH	
L603	1-412-951-11	INDUCTOR 10uH	
L701	1-412-058-11	INDUCTOR CHIP 10uH	
L703	1-414-078-11	INDUCTOR 10uH	
L704	1-412-058-11	INDUCTOR CHIP 10uH	
L706	1-412-058-11	INDUCTOR CHIP 10uH	
L707	1-412-979-21	INDUCTOR 1uH	
L708	1-412-979-21	INDUCTOR 1uH	
L709	1-412-052-21	INDUCTOR CHIP 1uH	
L710	1-412-052-21	INDUCTOR CHIP 1uH	
L712	1-414-078-11	INDUCTOR 10uH	
L714	1-412-058-11	INDUCTOR CHIP 10uH	
L715	1-414-078-11	INDUCTOR 10uH	
L716	1-414-078-11	INDUCTOR 10uH	
L751	1-414-078-11	INDUCTOR 10uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remarks
Q060	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q061	8-729-101-07	TRANSISTOR 2SB798-DL	
Q062	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q063	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q064	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q065	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q101	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q102	8-729-402-48	TRANSISTOR UN521E-TX	
Q103	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q104	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q105	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q105	8-729-905-23	TRANSISTOR 2SA1576-R	
Q106	8-729-905-23	TRANSISTOR 2SA1576-R	
Q107	8-729-824-02	TRANSISTOR 2SA1838	
Q108	8-729-402-42	TRANSISTOR UN5213	

Ref. No.	Part No.	Description	Remarks
Q109	8-729-402-42	TRANSISTOR UN5213	
Q110	8-729-012-50	TRANSISTOR 2SC4400-3/4/5	
Q111	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q112	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q113	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q114	8-729-402-42	TRANSISTOR UN5213	
Q120	8-729-403-35	TRANSISTOR UN5113	
Q123	8-729-015-74	TRANSISTOR UN5111-TX	
Q124	8-729-117-73	TRANSISTOR 2SC4178-F14	
Q125	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q126	8-729-402-42	TRANSISTOR UN5213	
Q129	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q130	8-729-012-50	TRANSISTOR 2SC4400-3/4/5	
Q131	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q202	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q206	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q208	8-729-402-42	TRANSISTOR UN5213	
Q212	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q213	8-729-402-42	TRANSISTOR UN5213	
Q214	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q215	8-729-013-15	TRANSISTOR 2SC4909-TL	
Q216	8-729-420-20	TRANSISTOR XN4312	
Q217	8-729-420-12	TRANSISTOR XN4213	
Q218	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q219	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q221	8-729-402-42	TRANSISTOR UN5213	
Q222	8-729-402-42	TRANSISTOR UN5213	
Q223	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q224	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q226	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q227	8-729-013-15	TRANSISTOR 2SC4909-TL	
Q303	8-729-015-76	TRANSISTOR UN5211-TX	
Q400	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q401	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q501	8-729-420-53	TRANSISTOR UN5115	
Q503	8-729-823-16	TRANSISTOR 2SC4555-5.6.7	
Q504	8-729-823-16	TRANSISTOR 2SC4555-5.6.7	
Q506	8-729-421-26	TRANSISTOR UN5214	
Q507	8-729-421-26	TRANSISTOR UN5214	
Q570	8-729-402-42	TRANSISTOR UN5213	
Q601	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q602	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q603	8-729-420-53	TRANSISTOR UN5115	
Q701	8-729-403-27	TRANSISTOR XN4401	
Q703	8-729-402-42	TRANSISTOR UN5213	
Q704	8-729-403-35	TRANSISTOR UN5113	
Q705	8-729-403-35	TRANSISTOR UN5113	
Q706	8-729-402-42	TRANSISTOR UN5213	
Q750	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q752	8-729-420-24	TRANSISTOR 2SB1218A-QRS	

Ref. No.	Part No.	Description	Remarks
		< RESISTOR >	
R062	1-216-864-11	METAL CHIP 0 5% 1/16W	
R063	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R077	1-216-138-00	METAL CHIP 3.3 5% 1/8W	
R078	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R079	1-216-820-11	METAL CHIP 820 5% 1/16W	
R080	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R081	1-216-818-11	METAL CHIP 560 5% 1/16W	
R082	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R083	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R084	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R085	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R086	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R087	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R088	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R091	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R092	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R101	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R102	1-216-815-11	METAL CHIP 330 5% 1/16W	
R103	1-216-815-11	METAL CHIP 330 5% 1/16W	
R104	1-216-797-11	METAL CHIP 10 5% 1/16W	
R105	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R106	1-218-875-11	METAL CHIP 15K 0.50% 1/16W	
R107	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R108	1-216-864-11	METAL CHIP 0 5% 1/16W	
R109	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R110	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R111	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R112	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R113	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R114	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R115	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R116	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R117	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R118	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R119	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R120	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R121	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R122	1-216-818-11	METAL CHIP 560 5% 1/16W	
R123	1-216-815-11	METAL CHIP 330 5% 1/16W	
R125	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R126	1-216-797-11	METAL CHIP 10 5% 1/16W	
R127	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R128	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R129	1-216-819-11	METAL CHIP 680 5% 1/16W	
R130	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R131	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R132	1-216-813-11	METAL CHIP 220 5% 1/16W	
R133	1-216-818-11	METAL CHIP 560 5% 1/16W	
R134	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R141	1-216-816-11	METAL CHIP 390 5% 1/16W	

Ref. No.	Part No.	Description				Remarks
R149	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R150	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R152	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R153	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R154	1-216-817-11	METAL CHIP	470	5%	1/16W	
R155	1-216-807-11	METAL CHIP	68	5%	1/16W	
R156	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R157	1-216-816-11	METAL CHIP	390	5%	1/16W	
R158	1-216-819-11	METAL CHIP	680	5%	1/16W	
R159	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R160	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R161	1-216-864-11	METAL CHIP	0	5%	1/16W	
R162	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R163	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R164	1-216-864-11	METAL CHIP	0	5%	1/16W	
R165	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R166	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R167	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R168	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R169	1-216-804-11	METAL CHIP	39	5%	1/16W	
R170	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R171	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R172	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R173	1-216-864-11	METAL CHIP	0	5%	1/16W	
R176	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R177	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R178	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R179	1-216-817-11	METAL CHIP	470	5%	1/16W	
R180	1-216-818-11	METAL CHIP	560	5%	1/16W	
R181	1-216-818-11	METAL CHIP	560	5%	1/16W	
R182	1-216-809-11	METAL CHIP	100	5%	1/16W	
R183	1-216-818-11	METAL CHIP	560	5%	1/16W	
R184	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R185	1-216-818-11	METAL CHIP	560	5%	1/16W	
R186	1-216-818-11	METAL CHIP	560	5%	1/16W	
R187	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R188	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R189	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R190	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R191	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R192	1-216-814-11	METAL CHIP	270	5%	1/16W	
R193	1-216-813-11	METAL CHIP	220	5%	1/16W	
R194	1-216-806-11	METAL GLAZE	56	5%	1/16W	
R195	1-216-809-11	METAL CHIP	100	5%	1/16W	
R196	1-216-818-11	METAL CHIP	560	5%	1/16W	
R197	1-216-864-11	METAL CHIP	0	5%	1/16W	
R201	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R202	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R203	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R204	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	

Ref. No.	Part No.	Description				Remarks
R210	1-216-864-11	METAL CHIP	0	5%	1/16W	
R212	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R213	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R214	1-216-807-11	METAL CHIP	68	5%	1/16W	
R215	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R216	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R218	1-218-879-11	METAL CHIP	22K	0.50%	1/16W	
R219	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R220	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R221	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R222	1-216-818-11	METAL CHIP	560	5%	1/16W	
R223	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R225	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R228	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R229	1-218-863-11	METAL CHIP	4.7K	0.50%	1/16W	
R230	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R232	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R234	1-218-849-11	METAL CHIP	1.2K	0.50%	1/16W	
R235	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R239	1-216-864-11	METAL CHIP	0	5%	1/16W	
R241	1-218-839-11	METAL GLAZE	470	0.50%	1/16W	
R243	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R244	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R246	1-216-864-11	METAL CHIP	0	5%	1/16W	
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R248	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R249	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R254	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R255	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R256	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R257	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R259	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R260	1-216-817-11	METAL CHIP	470	5%	1/16W	
R261	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R262	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R265	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R266	1-216-864-11	METAL CHIP	0	5%	1/16W	
R267	1-216-864-11	METAL CHIP	0	5%	1/16W	
R268	1-216-818-11	METAL CHIP	560	5%	1/16W	
R270	1-216-817-11	METAL CHIP	470	5%	1/16W	
R271	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R272	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R273	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R274	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R276	1-216-864-11	METAL CHIP	0	5%	1/16W	
R277	1-216-819-11	METAL CHIP	680	5%	1/16W	
R279	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R281	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R283	1-216-819-11	METAL CHIP	680	5%	1/16W	
R284	1-216-819-11	METAL CHIP	680	5%	1/16W	

Ref. No.	Part No.	Description				Remarks
R286	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R287	1-216-864-11	METAL CHIP	0	5%	1/16W	
R289	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R290	1-216-864-11	METAL CHIP	0	5%	1/16W	
R291	1-216-864-11	METAL CHIP	0	5%	1/16W	
R293	1-216-817-11	METAL CHIP	470	5%	1/16W	
R294	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R295	1-216-852-11	METAL CHIP	390K	5%	1/16W	
R296	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R297	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R298	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R299	1-218-272-11	METAL GLAZE	5.1K	5%	1/16W	
R301	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R302	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R303	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R304	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R305	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R307	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R314	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R315	1-218-290-11	METAL GLAZE	6.2K	5%	1/16W	
R316	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R317	1-218-290-11	METAL GLAZE	6.2K	5%	1/16W	
R318	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R319	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R320	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R321	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R327	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R328	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R329	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R330	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R331	1-216-864-11	METAL CHIP	0	5%	1/16W	
R333	1-216-864-11	METAL CHIP	0	5%	1/16W	
R334	1-208-766-11	METAL GLAZE	220	0.50%	1/10W	
R400	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R401	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R402	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R403	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R404	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R405	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R406	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R407	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R408	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R409	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R410	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R411	1-216-864-11	METAL CHIP	0	5%	1/16W	
R412	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R413	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R414	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R417	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R418	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R419	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R420	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R421	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R422	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R423	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R424	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R425	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R426	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R427	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R428	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R429	1-216-800-11	METAL GLAZE	18	5%	1/16W	
R430	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R434	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R436	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R437	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R439	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R440	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R441	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R442	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R444	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R445	1-216-864-11	METAL CHIP	0	5%	1/16W	
R446	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R447	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R448	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R449	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R450	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R451	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R452	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R453	1-217-671-11	METAL CHIP	1	5%	1/10W	
R454	1-217-671-11	METAL CHIP	1	5%	1/10W	
R455	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R456	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R458	1-217-671-11	METAL CHIP	1	5%	1/10W	
R459	1-217-671-11	METAL CHIP	1	5%	1/10W	
R460	1-217-671-11	METAL CHIP	1	5%	1/10W	
R461	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R462	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R463	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R464	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R465	1-216-808-11	METAL CHIP	82	5%	1/16W	
R466	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R467	1-216-019-00	METAL CHIP	56	5%	1/10W	
R468	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R469	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R471	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R472	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R473	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R474	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R475	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R476	1-216-845-11	METAL CHIP	100K	5%	1/16W	

Ref. No.	Part No.	Description				Remarks
R477	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R478	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R479	1-216-817-11	METAL CHIP	470	5%	1/16W	
R481	1-216-817-11	METAL CHIP	470	5%	1/16W	
R482	1-216-817-11	METAL CHIP	470	5%	1/16W	
R501	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R502	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R503	1-218-897-11	METAL CHIP	120K	0.50%	1/16W	
R505	1-216-810-11	METAL CHIP	120	5%	1/16W	
R506	1-218-897-11	METAL CHIP	120K	0.50%	1/16W	
R507	1-216-810-11	METAL CHIP	120	5%	1/16W	
R511	1-218-875-11	METAL CHIP	15K	0.50%	1/16W	
R512	1-216-864-11	METAL CHIP	0	5%	1/16W	
R513	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R514	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R515	1-216-813-11	METAL CHIP	220	5%	1/16W	
R516	1-218-897-11	METAL CHIP	120K	0.50%	1/16W	
R517	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R522	1-216-817-11	METAL CHIP	470	5%	1/16W	
R523	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R526	1-216-817-11	METAL CHIP	470	5%	1/16W	
R527	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R528	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R529	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R531	1-216-817-11	METAL CHIP	470	5%	1/16W	
R532	1-216-817-11	METAL CHIP	470	5%	1/16W	
R533	1-216-864-11	METAL CHIP	0	5%	1/16W	
R537	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R556	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R557	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R558	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R570	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R571	1-218-871-11	METAL CHIP	10K	0.50%	1/16W	
R575	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R581	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R601	1-216-001-00	METAL CHIP	10	5%	1/10W	
R603	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R604	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R605	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R606	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R607	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R608	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R609	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R610	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R611	1-216-815-11	METAL CHIP	330	5%	1/16W	
R612	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R613	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R614	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R615	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R616	1-216-837-11	METAL CHIP	22K	5%	1/16W	

Ref. No.	Part No.	Description				Remarks
R618	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R619	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R620	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R621	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R623	1-216-864-11	METAL CHIP	0	5%	1/16W	
R628	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R629	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R630	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R631	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R632	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R701	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R702	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R703	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R704	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R706	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R707	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R708	1-216-864-11	METAL CHIP	0	5%	1/16W	
R709	1-218-847-11	METAL CHIP	1K	0.50%	1/16W	
R710	1-218-876-11	METAL CHIP	16K	0.50%	1/16W	
R713	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R714	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R715	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R717	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R719	1-216-818-11	METAL CHIP	560	5%	1/16W	
R720	1-216-818-11	METAL CHIP	560	5%	1/16W	
R721	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R722	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R723	1-216-818-11	METAL CHIP	560	5%	1/16W	
R724	1-216-818-11	METAL CHIP	560	5%	1/16W	
R725	1-216-864-11	METAL CHIP	0	5%	1/16W	
R726	1-216-846-11	METAL CHIP	120K	5%	1/16W	
R727	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R728	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R729	1-216-864-11	METAL CHIP	0	5%	1/16W	
R730	1-216-864-11	METAL CHIP	0	5%	1/16W	
R732	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R733	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R734	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R735	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R740	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R741	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R742	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R743	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R744	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R745	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R751	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R756	1-216-864-11	METAL CHIP	0	5%	1/16W	
R757	1-216-864-11	METAL CHIP	0	5%	1/16W	
R758	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R759	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R775	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	

Ref. No.	Part No.	Description	Remarks
		< SWITCH >	
S301	1-692-088-41	SWITCH, TACTILE (EDIT SEARCH +)	
S302	1-692-088-41	SWITCH, TACTILE (EDIT SEARCH -)	
S303	1-692-088-41	SWITCH, TACTILE (PLAY)	
S304	1-692-088-41	SWITCH, TACTILE (PAUSE)	
S305	1-692-088-41	SWITCH, TACTILE (REW)	
S306	1-692-088-41	SWITCH, TACTILE (FF)	
S307	1-692-088-41	SWITCH, TACTILE (STOP)	
		< VIBRATOR >	
X400	1-760-315-11	VIBRATOR, CRYSTAL 11.718MHz	
X701	1-760-321-11	VIBRATOR, CRYSTAL 28.375MHz	
X702	1-579-780-21	VIBRATOR, CRYSTAL 17.7MHz	

	A-7072-428-A	VF-93P BOARD, COMPLETE **********************	
			(Ref.No.4,000 Series)
		< CAPACITOR >	
C851	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C852	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C853	1-104-916-11	TANTAL. CHIP 6.8uF 20% 20V	
C854	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C855	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C856	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C857	1-164-676-11	CERAMIC CHIP 2200PF 5% 16V	
C858	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C859	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C860	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C861	1-104-917-11	TANTAL. CHIP 15uF 20% 20V	
C862	1-165-178-11	CERAMIC CHIP 6.8uF 16V	
C863	1-163-020-00	CERAMIC CHIP 0.0082uF 10% 50V	
C864	1-163-020-00	CERAMIC CHIP 0.0082uF 10% 50V	
C865	1-164-217-11	CERAMIC CHIP 150PF 5% 50V	
C866	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C867	1-107-682-11	CERAMIC CHIP 1uF 10% 16V	
C868	1-165-128-11	CERAMIC CHIP 0.22uF 16V	
C869	1-163-020-00	CERAMIC CHIP 0.0082uF 10% 50V	
C870	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C890	1-165-128-11	CERAMIC CHIP 0.22uF 16V	
		< CONNECTOR >	
CN851	1-766-344-21	CONNECTOR, FFC/FPC 14P	
CN852	1-573-354-11	CONNECTOR, FFC/FPC 14P	
CN853	1-573-811-11	CONNECTOR, BOARD TO BOARD 12P	
		< DIODE >	
D851	8-719-951-21	DIODE PR1102W	
D852	8-719-043-70	DIODE MA6S121-(TX)	
D853	8-719-802-36	DIODE 1SS250	

Ref. No.	Part No.	Description	Remarks
		< IC >	
IC851	8-759-097-75	IC MB3789PFV-G-BND	
IC852	8-759-701-01	IC NJM2904M	
		< COIL >	
L851	1-412-033-11	INDUCTOR CHIP 220uH	
L852	1-412-029-11	INDUCTOR CHIP 10uH	
L853	1-412-033-11	INDUCTOR CHIP 220uH	
		< TRANSISTOR >	
Q851	8-729-024-60	TRANSISTOR MTD6N15T4	
Q853	8-729-027-29	TRANSISTOR DTA123JKA	
		< RESISTOR >	
R851	1-216-819-11	METAL CHIP 680 5% 1/16W	
R852	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R853	1-218-899-11	METAL CHIP 150K 0.50% 1/16W	
R854	1-218-901-11	METAL CHIP 180K 0.50% 1/16W	
R855	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R856	1-218-899-11	METAL CHIP 150K 0.50% 1/16W	
R857	1-218-903-11	METAL CHIP 220K 0.50% 1/16W	
R858	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R859	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R860	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R861	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R862	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R863	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R864	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R865	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R867	1-216-850-11	METAL CHIP 270K 5% 1/16W	
R868	1-216-864-11	METAL CHIP 0 5% 1/16W	
R869	1-218-893-11	METAL CHIP 82K 0.50% 1/16W	
R870	1-218-887-11	METAL CHIP 47K 0.50% 1/16W	
R871	1-216-850-11	METAL CHIP 270K 5% 1/16W	
R872	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R873	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R874	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R875	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R878	1-216-809-11	METAL CHIP 100 5% 1/16W	
R879	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R880	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R881	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R891	1-216-296-91	CONDUCTOR, CHIP (3216)	
		< TRANSFORMER >	
⚠T851	1-426-849-31	TRANSFORMER, INVERTER	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

VF-94P

Ref. No.	Part No.	Description			Remarks
	A-7072-399-A	VF-94P BOARD, COMPLETE			
		**********************			
					(Ref.No.4,000 Series)
		< CAPACITOR >			
C901	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C902	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C903	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C904	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C905	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C906	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C907	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C908	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C909	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C910	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C911	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C912	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C913	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C914	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C915	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C917	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C918	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C920	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C921	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C922	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C923	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C924	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C925	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C926	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C927	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C928	1-104-912-11	TANTAL. CHIP	3.3uF	20%	16V
C929	1-104-912-11	TANTAL. CHIP	3.3uF	20%	16V
C930	1-104-912-11	TANTAL. CHIP	3.3uF	20%	16V
C931	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C933	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C934	1-165-320-11	CERAMIC CHIP	0.47uF	10%	16V
C935	1-135-179-21	TANTAL. CHIP	2.2uF	20%	16V
C936	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C937	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C938	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C939	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C940	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C941	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C942	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C943	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C947	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C948	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C949	1-135-178-11	TANTAL. CHIP	1.5uF	20%	20V
C950	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C951	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C952	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C953	1-164-346-11	CERAMIC CHIP	1uF		16V
C954	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C956	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C970	1-162-974-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
CN901	1-573-354-11	CONNECTOR, FFC/FPC 14P			
* CN902	1-573-984-11	CONNECTOR, BOARD TO BOARD 10P			
* CN903	1-573-356-11	CONNECTOR, FFC/FPC 16P			
		< DIODE >			
D901	8-713-102-80	DIODE 1T369-01-T8A			
D902	8-713-102-80	DIODE 1T369-01-T8A			
D903	8-719-404-49	DIODE MA111			
		< IC >			
IC901	8-752-067-59	IC CXA1785R-T4			
IC902	8-752-369-16	IC CXD2411R			
IC903	8-759-251-40	IC MB88E346PFV-G-BND-ER			
IC904	8-759-075-66	IC TA75S01F			
		< COIL >			
L901	1-412-951-11	INDUCTOR 10uH			
L902	1-412-960-21	INDUCTOR 56uH			
L903	1-412-956-21	INDUCTOR 27uH			
L904	1-412-959-11	INDUCTOR 47uH			
L905	1-412-949-21	INDUCTOR 6.8uH			
L906	1-412-962-11	INDUCTOR 82uH			
		< TRANSISTOR >			
Q901	8-729-402-84	TRANSISTOR XN4601			
Q902	8-729-402-42	TRANSISTOR UN5213			
Q903	8-729-230-63	TRANSISTOR 2SC4116-YG			
		< RESISTOR >			
R902	1-218-877-11	METAL CHIP	18K	0.50%	1/16W
R903	1-216-842-11	METAL CHIP	56K	5%	1/16W
R904	1-216-857-11	METAL CHIP	1M	5%	1/16W
R905	1-216-864-11	METAL CHIP	0	5%	1/16W
R906	1-216-841-11	METAL CHIP	47K	5%	1/16W
R907	1-216-833-11	METAL CHIP	10K	5%	1/16W
R908	1-216-821-11	METAL CHIP	1K	5%	1/16W
R910	1-216-814-11	METAL CHIP	270	5%	1/16W
R911	1-216-864-11	METAL CHIP	0	5%	1/16W
R912	1-216-821-11	METAL CHIP	1K	5%	1/16W
R913	1-220-397-11	METAL GLAZE	4.7M	5%	1/16W
R914	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R918	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R919	1-216-839-11	METAL CHIP	33K	5%	1/16W
R920	1-216-839-11	METAL CHIP	33K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R921	1-220-397-11	METAL GLAZE	4.7M	5%	1/16W
R922	1-216-839-11	METAL CHIP	33K	5%	1/16W
R923	1-216-839-11	METAL CHIP	33K	5%	1/16W
R924	1-216-821-11	METAL CHIP	1K	5%	1/16W
R925	1-216-839-11	METAL CHIP	33K	5%	1/16W
R926	1-216-841-11	METAL CHIP	47K	5%	1/16W
R930	1-216-833-11	METAL CHIP	10K	5%	1/16W
R931	1-216-839-11	METAL CHIP	33K	5%	1/16W
R934	1-216-821-11	METAL CHIP	1K	5%	1/16W
R935	1-216-864-11	METAL CHIP	0	5%	1/16W
R936	1-218-875-11	METAL CHIP	15K	0.50%	1/16W
R937	1-218-905-11	METAL CHIP	270K	0.50%	1/16W
R938	1-216-849-11	METAL CHIP	220K	5%	1/16W
R939	1-216-837-11	METAL CHIP	22K	5%	1/16W
R945	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R946	1-216-864-11	METAL CHIP	0	5%	1/16W
R947	1-216-807-11	METAL CHIP	68	5%	1/16W
R948	1-216-807-11	METAL CHIP	68	5%	1/16W
R949	1-216-807-11	METAL CHIP	68	5%	1/16W
R950	1-216-837-11	METAL CHIP	22K	5%	1/16W
R953	1-216-840-11	METAL CHIP	39K	5%	1/16W
R954	1-216-840-11	METAL CHIP	39K	5%	1/16W
R955	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R959	1-216-844-11	METAL CHIP	82K	5%	1/16W
R960	1-216-845-11	METAL CHIP	100K	5%	1/16W
R961	1-216-850-11	METAL CHIP	270K	5%	1/16W
R969	1-216-839-11	METAL CHIP	33K	5%	1/16W
R970	1-216-839-11	METAL CHIP	33K	5%	1/16W
R971	1-216-839-11	METAL CHIP	33K	5%	1/16W
R973	1-216-839-11	METAL CHIP	33K	5%	1/16W
R974	1-216-839-11	METAL CHIP	33K	5%	1/16W
R975	1-216-842-11	METAL CHIP	56K	5%	1/16W
R976	1-216-838-11	METAL CHIP	27K	5%	1/16W
R979	1-216-849-11	METAL CHIP	220K	5%	1/16W
R980	1-216-864-11	METAL CHIP	0	5%	1/16W
R981	1-216-849-11	METAL CHIP	220K	5%	1/16W
R982	1-216-849-11	METAL CHIP	220K	5%	1/16W
R990	1-216-864-11	METAL CHIP	0	5%	1/16W
		< VIBRATOR >			
X901	1-579-661-21	OSCILLATOR, CRYSTAL 4.43MHz			

MISCELLANEOUS
****

Ref. No.	Part No.	Description	Remarks
61	1-542-259-11	MICROPHONE, CAP	
66	1-775-517-11	CABLE, FLEXIBLE FLAT 8P	
103	1-775-520-11	CABLE, FLEXIBLE FLAT 45P	
120	1-775-519-11	CABLE, FLEXIBLE FLAT 4P	
164	8-753-015-20	LCX005BK-5	
203	1-775-518-11	CABLE, FLEXIBLE FLAT 12P	
207	1-775-516-11	CABLE, FLEXIBLE FLAT 16P	
209	1-547-739-21	LENS, ZOOM (VCL-5412WB)	
211	1-547-558-21	FILTER BLOCK, OPTICAL	
218	1-775-833-11	CABLE, FLEXIBLE FLAT 18P	
D001	8-719-988-42	DIODE GL453S	
IC790	A-7030-369-A	CCD BLOCK ASSY (ICX055AK-11) (CCD IMAGER)	
M901	A-7048-806-A	DRUM BLOCK ASSY (DGH-0C2A-R)	
M902	8-835-531-01	MOTOR, DC SCE-0601A (CAPSTAN)	
M903	X-3945-401-1	MOTOR ASSY, DC (LOADING)	
S901	1-762-436-11	SWITCH, ROTARY (ENCODER)	

ACCESSORIES & PACKING MATERIALS
****

	Part No.	Description
⚠	A-7003-840-A	AC-V15 AC POWER(E,Australian,AEP)
⚠	A-7003-842-A	AC-V15 AC POWER(UK)
⚠	A-7003-969-A	AC-V15 AC POWER(Hong Kong)
	A-7092-608-A	CASE (N) ASSY, BATTERY(AEP)
	1-473-342-11	REMOTE COMMANDER (RMT-713)
⚠	1-569-008-11	ADAPTER, CONVERSION 2P(E,Hong Kong)
	1-573-291-11	CONNECTOR, CONVERSION (AEP)
	1-575-334-11	CORD, CONNECTION (AV)1.5m
	1-769-285-11	CORD, CONNECTION
	3-800-473-13	MANUAL, INSTRUCTION(ENGLISH/SPANISH) (AEP,UK)
	3-800-473-43	MANUAL, INSTRUCTION(GERMAN/ITALIAN) (AEP)
	3-800-473-53	MANUAL, INSTRUCTION(FRENCH/DUTCH)(AEP)
	3-800-473-63	MANUAL, INSTRUCTION(SWEDISH/PORTUGUESE) (AEP)
	3-800-473-72	MANUAL, INSTRUCTION(ENGLISH/RUSSIAN) (AEP)
	3-800-474-12	MANUAL, INSTRUCTION(ENGLISH/RUSSIAN) (E,Australian,Hong Kong)
	3-800-474-42	MANUAL, INSTRUCTION(FRENCH/GERMAN) (E,Hong Kong)
	3-800-474-52	MANUAL, INSTRUCTION (ARABIC/PORTUGUESE)(E)
	3-800-474-62	MANUAL, INSTRUCTION(CHINESE) (E,Hong Kong)
	3-800-844-11	INSTRUCTION(AEP)
	3-947-969-21	BELT (S), SHOULDER
*	3-966-372-01	CUSHION, PULP
*	3-969-029-01	CARTON, INDIVIDUAL(E,Hong Kong)
*	3-969-029-11	CARTON, INDIVIDUAL(Australian)
*	3-969-029-41	CARTON, INDIVIDUAL(AEP)
**	NP-33	BATTERY PACK

NOTE.
**MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 6
ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 6-26.

6-1. CAMERA SECTION ADJUSTMENT
1-1. PREPARATIONS BEFORE ADJUSTMENT

1-1-1. List of service tools

Oscilloscope
Adjustment screw driver
Regulated power supply
Color monitor
Vectorscope
Digital voltmeter
Pattern generator

Ref.No.	Name	Parts Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0 ND filter 0.3	J-6080-808-A J-6080-818-A	White balance check White balance check
J-3	Pattern box PTB-450	J-6082-200-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Siemens star	J-6080-875-A	For checking the flange back
J-6	Adjustment remote commander(RM-95 upgraded) Note	J-6082-053-B	
J-7	Multi CPC	J-6082-311-A	For video section adjustment (VC-167P board CN002)
J-8	Measuring pin tool for viewfinder	J-6082-192-A	For adjusting the viewfinder

Note: If the microprocessor IC in the adjusting remote commander is not the new microprocessor (UPD7503G-C56-12), the pages cannot be switched.
In this case, replace with the new microprocessor (8-759-148-35).

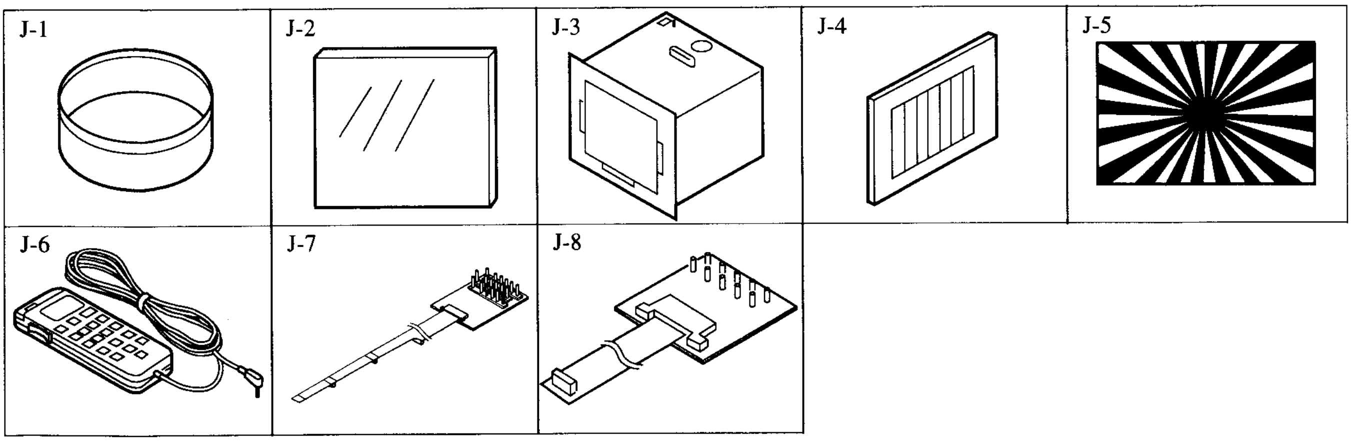


Fig.6-1-1.

1-1-2. Precautions

1. Switch settings

Adjust the switches to the following positions without loading the cassette tape unless otherwise specified.

1) Camera/video power switch
   Operation switch block ....Camera
2) PROGRAM AE switch (CF-40 board S489)................AUTO
3) D ZOOM switch (CF-40 board S300)..............................OFF
4) REC MODE switch (CF-40 board S483) ....SP

2. Adjustment sequence

Adjust in the given order.

3. Subject

1) Set the camera and pattern box as shown in Fig. 6-1-2.
2) Color bar chart (Standard picture frame)

- Adjust the picture frame as shown in Fig. 6-1-3.
- Adjust camera zooming and direction until the camera output waveform on the oscilloscope shown in Fig. 6-1-3 (a) and the color picture on the monitor TV shown in Fig. 6-1-3 (b) have been acquired.
- Maintain this setup until adjustment is complete.

3) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box and adjust the camera setup until the white pattern picture frame is the same size and same position as the color bar chart (the standard picture frame).

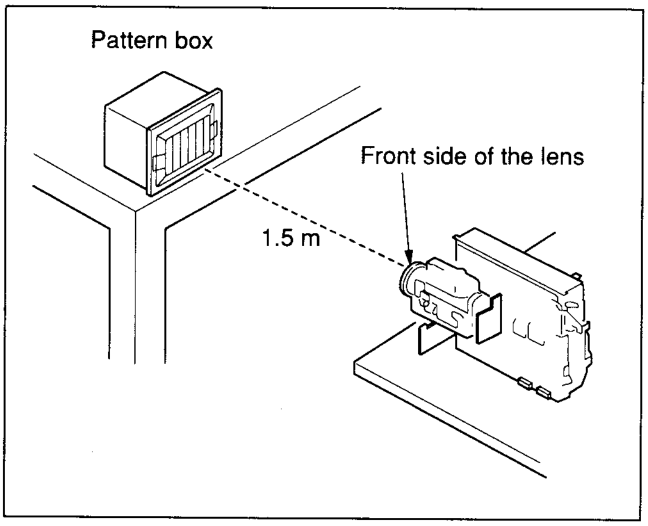
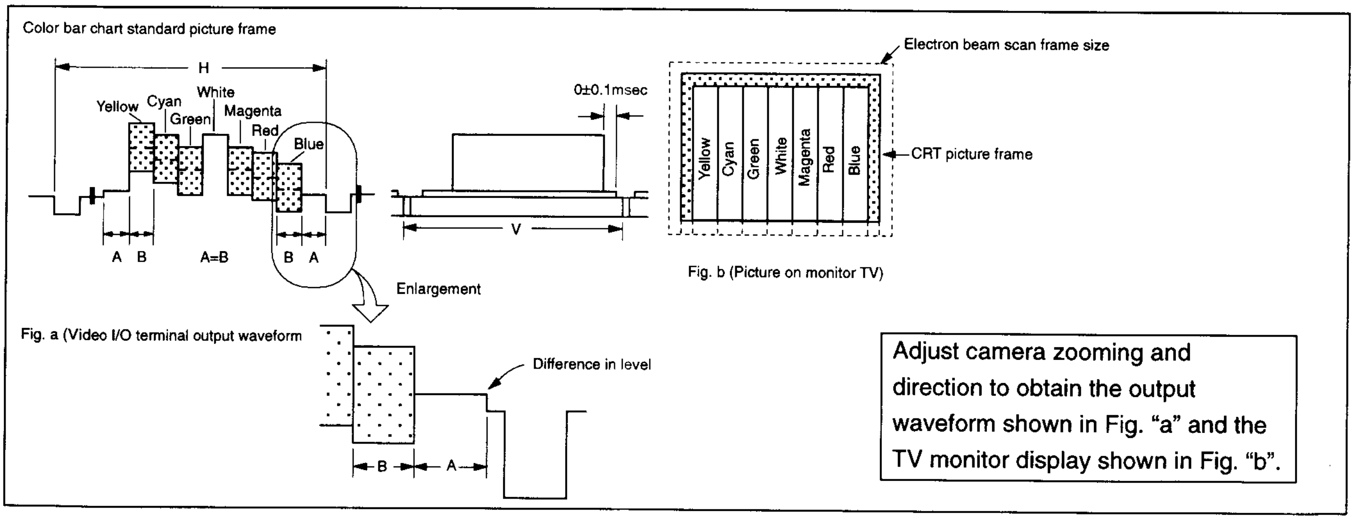

Pattern box
Front side of the lens
1.5 m

Fig. 6-1-2


Color bar chart standard picture frame
H
Yellow
Cyan
White
Green
Magenta
Red
Blue
A
B
A=B
B
A
0±0.1msec
V
Enlargement
Fig. a (Video I/O terminal output waveform
Difference in level
B
A
Electron beam scan frame size
Yellow
Cyan
Green
White
Magenta
Red
Blue
CRT picture frame
Fig. b (Picture on monitor TV)

Adjust camera zooming and direction to obtain the output waveform shown in Fig. "a" and the TV monitor display shown in Fig. "b".

Fig. 6-1-3

4) Chart for flange back adjustment
   Join together a piece of white A0 size paper (1189 mm × 841 mm) and a piece of black paper to make the chart shown in Fig. 6-1-4.

Note : Use a non-reflecting and non-glazing vellum paper. The size must be A0 or larger and the joint between the white and black paper must not have any undulations.

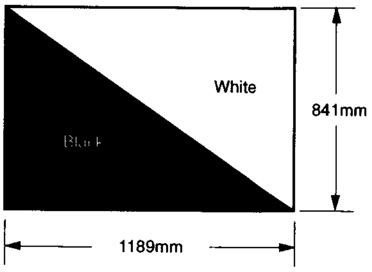

White
Black
841mm
1189mm

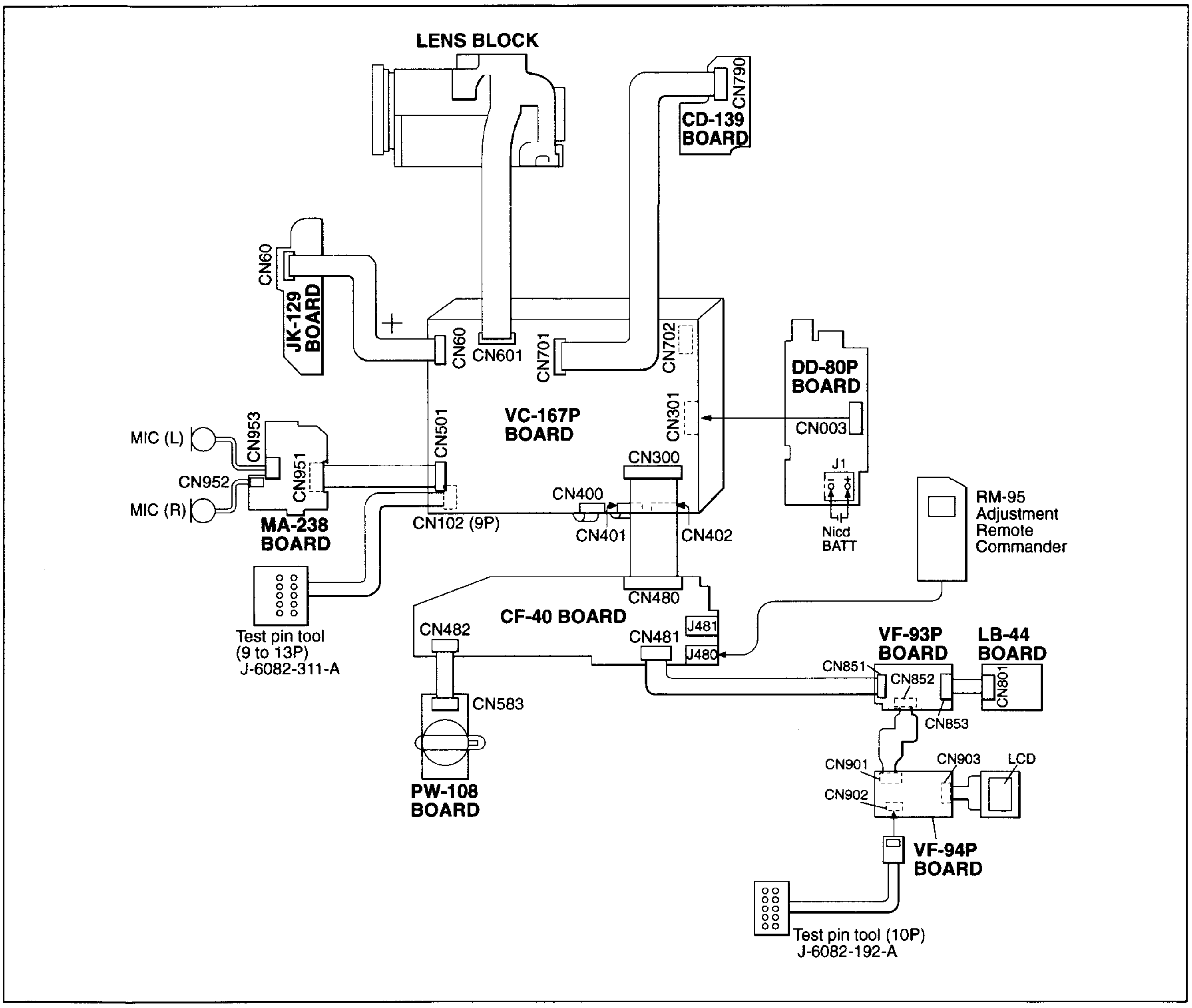
Fig. 6-1-4

1-1-3. Preparations

Note 1: Refer to "2. Disassembly" for details of how to remove the cabinet and the respective boards.

Note 2: Removal of the lens block and VC-167P board is not necessary if only adjustments are to be made.

1.) Connect the adjustment equipment as shown in Fig. 6-1-5.



LENS BLOCK
CN790
CD-139 BOARD
CN60
JK-129 BOARD
CN60
CN601
CN701
CN702
DD-80P BOARD
CN003
J1
Nicd BATT
MIC (L)
CN953
CN952
MIC (R)
CN951
CN501
VC-167P BOARD
CN301
CN300
CN400
CN401
CN402
MA-238 BOARD
CN102 (9P)
RM-95 Adjustment Remote Commander
Test pin tool (9 to 13P) J-6082-311-A
CF-40 BOARD
CN480
CN482
CN481
J481
J480
VF-93P BOARD
LB-44 BOARD
CN851
CN852
CN801
CN853
CN583
PW-108 BOARD
CN901
CN903
LCD
CN902
VF-94P BOARD
Test pin tool (10P) J-6082-192-A

Fig. 6-1-5.

1-1-4. Adjustment remote commander (RM-95 upgraded)

To perform adjustment, the adjustment data stored in the non-volatile memory must be rewritten using the adjustment remote commander (RM-95 upgraded).

The adjustment remote commander uses the remote commander signal line (LANC) to interactively communicate with the merchandise. The page, address and up/down command data are sent from the adjustment remote commander to the merchandise. In return, the page, address and data are sent to the adjustment remote commander from the merchandise.

1. Using the adjustment remote commander

1) Connect the adjustment remote commander to the LANC terminal (CF-40 board J480).
2) Set the NOR-ADJ (or HOLD) switch of the adjustment remote commander to the "ADJ" (or ON) (service) position.
   If the adjustment remote commander is correctly connected, the adjustment remote commander's LED will show the display as shown in Fig. 6-1-6.
3) Bit value discrimination
   It is necessary to discriminate between the bit values with the data displayed on the adjustment remote commander for all following items. Identify whether the bit value is '1' or '0' with the use of the following diagram.

Display on the adjustment remote commander

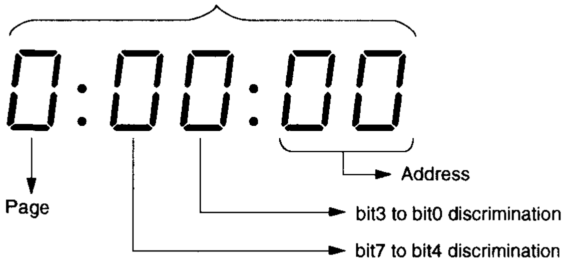


Fig 6-1-6

Display on the adjustment remote commander	Bit values			
	bit3 or bit7	bit2 or bit6	bit1 or bit5	bit0 or bit4
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
Ⓐ 8	1	0	0	0
9	1	0	0	1
A(A)	1	0	1	0
B(b)	1	0	1	1
C(C)	1	1	0	0
D(d)	1	1	0	1
Ⓑ E(E)	1	1	1	0
F(F)	1	1	1	1

(example) If "8E" is displayed on the adjustment remote commander, the bit values for bit7 to bit4 are shown in the 'Ⓐ' column, and the bit values for bit3 to bit0 are shown in the 'Ⓑ' column.

4) The adjustment remote controller is operated as follows:

- Changing the page

  The pages increase when the EDIT SEARCH (+) button is pressed and decrease when the EDIT SEARCH (-) button is pressed. Altogether there are 16 pages from page "0" to page "F".

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LCD display	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F
Decimal notation after conversion	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

- Changing the address

  The address increases when the FF (▶▶) button is pressed, and decreases when the REW (◀◀) button is pressed. Altogether there are 256 addresses from address "00" to address "FF". Some addresses, which are not used during adjustment, do not appear.

- Taking note the already-stored adjustment data

  The previous adjustment can be erased if the adjustment remote commander is incorrectly handled. To prevent this, it is recommended that all the stored adjustment data be noted down on the attached page F address list.

- Changing the data (Data setting)

  The data increases when the PLAY (▶) button is pressed, and decreases when the STOP (■) button is pressed. Altogether there 256 data from data "00" to data "FF".

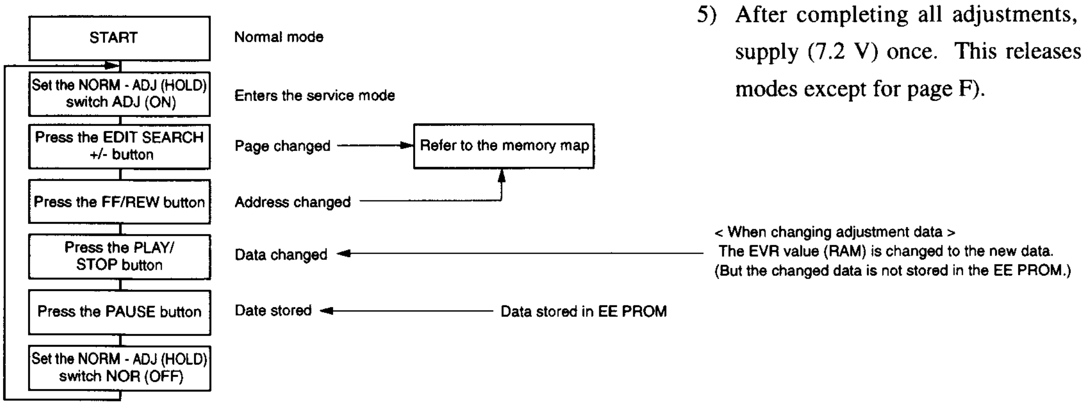
- Storing the data

  Press the PAUSE button to store the adjustment data (page F) into the non-volatile memory.

  (If the PAUSE button is not pressed after completing the adjustment, the new adjustment data will not be stored in the non-volatile memory.)

5) After completing all adjustments, turn off the main power supply (7.2 V) once. This releases the adjustment mode (all modes except for page F).

[Sequence of Service Modes Using the Adjustment Remote Commander]


START
Normal mode
Set the NORM - ADJ (HOLD) switch ADJ (ON)
Enters the service mode
Press the EDIT SEARCH +/- button
Page changed
Refer to the memory map
Press the FF/REW button
Address changed
Press the PLAY/ STOP button
Data changed
< When changing adjustment data >
The EVR value (RAM) is changed to the new data.
(But the changed data is not stored in the EE PROM.)
Press the PAUSE button
Date stored
Data stored in EE PROM
Set the NORM - ADJ (HOLD) switch NOR (OFF)

Command Name	Command Function	Normal LANC Command
Page Up	Page + 1	Edit Search +
Page Down	Page - 1	Edit Search -
Direct Page Set	Sets the specified page	Event Clear
Address Up	Address + 1	Fast Forward
Address Down	Address - 1	Rewind
Data Up	Data + 1	Play Back
Data Down	Data - 1	Stop
Store	Stores data in the EE PROM.	Pause

2. Precautions when using the adjustment remote commander

Mishandling of the adjustment remote commander may erase the correct adjustment data which has already been stored in the memory. To prevent this, it is recommended that all adjustment data is noted down on the attached page F address list before starting adjustments in addition to all new adjustment data after the completion of each adjustment step.

Page F Address List

Note 1: Data already stored in the adjustment data memo column are fixed values.

Note 2: The initial adjustment data values are the values which exist immediately after the execution of "F Page Data Initialization" and "F Page Data Modification". These differ from the values which exist after all adjustment have been performed.

Note 3: There are cases where data has been entered into F page addresses between 8C and EF, but these are not related to the adjustments.

Address	Adjustment Data	
	Initial Value	Memo Column
00	00	00
01	00	00
02	00	00
03	04	04
04	10	10
05	E0	E0
06	10	10
07	00	00
08	04	04
09	00	00
0A	FF	
0B	08	
0C	00	
0D	00	
0E	00	
0F	00	
10	00	
11	00	
12	80	
13	40	
14	40	
15	80	
16	80	
17	9E	
18	80	
19	68	
1A	7E	
1B	85	
1C	80	
1D	64	
1E	80	
1F	AD	
20	9E	
21	87	
22	C6	
23	C1	
24	58	
25	60	
26	80	

Address	Adjustment Data	
	Initial Value	Memo Column
27	80	
28	48	
29	40	
2A	80	
2B	80	
2C	40	
2D	00	
2E	2D	
2F	D3	
30	2D	
31	FD	
32	F3	
33	00	
34	3C	
35	00	
36	3E	
37	E0	
38	8F	
39	6C	
3A	36	
3B	3C	
3C	A3	
3D	0D	
3E	8E	
3F	12	
40	47	
41	10	
42	80	
43	80	
44	64	64
45	46	46
46	00	00
47	55	55
48	80	80
49	7B	7B
4A	80	80
4B	78	78
4C	80	80
4D	92	92

Address	Adjustment Data	
	Initial Value	Memo Column
4E	80	80
4F	91	91
50	80	80
51	80	80
52	80	80
53	A8	A8
54	CC	CC
55	3C	3C
56	1B	1B
57	80	80
58	80	80
59	80	80
5A	79	79
5B	4C	4C
5C	1A	1A
5D	36	36
5E	23	23
5F	45	45
60	16	16
61	A2	A2
62	A3	A3
63	BA	BA
64	2C	2C
65	09	09
66	66	66
67	07	07
68	66	66
69	9F	9F
6A	66	66
6B	66	66
6C	59	59
6D	83	83
6E	67	67
6F	5D	5D
70	5C	5C
71	4A	4A
72	1E	1E
73	5C	5C
74	3A	3A
75	33	33
76	02	02
77	1B	1B
78	E8	E8
79	28	28
7A	0D	0D
7B	6A	6A
7C	58	58
7D	44	44

Address	Adjustment Data	
	Initial Value	Memo Column
7E	33	33
7F	05	05
80	07	07
81	03	03
82	40	40
83	56	56
84	5D	5D
85	60	60
86	04	04
87	0F	0F
88	10	10
89	0A	0A
8A	38	38
8B	B0	B0
8C～E3		
E4～EF		
F0～FF		

1-2. CAMERA SYSTEM ADJUSTMENTS

1. Adjustment points when major parts have been replaced

When the CCD imager or lens block is replaced, adjust the items indicated by ○ in the following table.

	When the CCD imager is replaced	When the lens block is replaced
HALL adjustment		○
CCD imager compensation data writing	○	
Flange back adjustment	○	○
IRIS IN/OUT adjustment	○	○
MAX GAIN adjustment	○	
Color reproduction adjustment	○	
Auto white balance reference data input	○	
Auto white balance adjustment	○	

3. Preparation for adjustment

Objective: Make sure that the camera can be operated from the LANC line even if the mode control microprocessor's A/D port is left open.

Mode	Any Mode
Measuring Equipment	Remote controller RM-95 upgraded for LANC
Adjustment Page	Page 6, page F
Adjustment Address	00, 02

2. Power supply voltage check (VC-167P board)

Subject	Any subject
Measuring equipment	Digital voltmeter
DIG5V check	
Measurement Point	CN300 ㊶ Pin (CN300 ㊳, ㊴ Pin: MT GND)
Specification Value	4.86±0.15Vdc
DIG3.5V check	
Measurement Point	CN300 ㉚ Pin (CN300 ㉛, ㉜ Pin: VTR GND)
Specification Value	3.16±0.1Vdc
CAM15V check	
Measurement Point	CN701 ⑯ Pin (CN701 ① Pin: GND)
Specification Value	14.95±0.4Vdc
CAM-8.5V check	
Measurement Point	CN701 ⑭ Pin (CN701 ① Pin: GND)
Specification Value	-8.5±0.5Vdc

Check procedure

1) Check that all power supply voltages satisfy the specified value.
   If not, refer to "Video circuit, Power supply block adjustment".

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Turn the main power switch ON.
2	6	00	01	After setting the data, press the PAUSE button.
3	F	02	21	After setting the data, press the PAUSE button.
4				Turn off the UNREG power supply once, then turn it on.
5	6	00	00	After setting the data, press the PAUSE button.

Note 1: If data 01 is set to page 6, address 00, the adjustment for page F, address 01 to 8B can also be performed.

Note 2: When all adjustments of the camera system is completed, set data 00 to the page F, address 02.

4. Initialization of page F data

Note 1: Execute the initialization of page F only when the non-volatile memory (VC-167P board IC401 EE PROM) is replaced.

Note 2: If the page F data has been initialized, all adjustment items of the camera section must be executed again.

Initializing procedure:

Order	Page	Address	Data	Procedure
1				Turn OFF and ON the main power supply. (Preparation)
2	6	00	01	After setting the data 01 to the address, press the PAUSE button.
3	6	11		Confirm that the data is 00.
4	6	01	2D	After setting the data, Press the PAUSE button. (Execution of page F data initialization. By this operation, all the data from address 01 to EF are initialized.)
5	6	11		Confirm that the data is 01.

Works required after initialization

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, Press the PAUSE button.
2	6	00	00	After setting the data, Press the PAUSE button. (End)
				Perform the next item "5. Page F Data Modifications", then execute all adjustment items of the camera section.

Related Adjustments:

All items of camera adjustment excluding "28 MHz Crystal Oscillator Adjustment".

5. V SUB adjustment

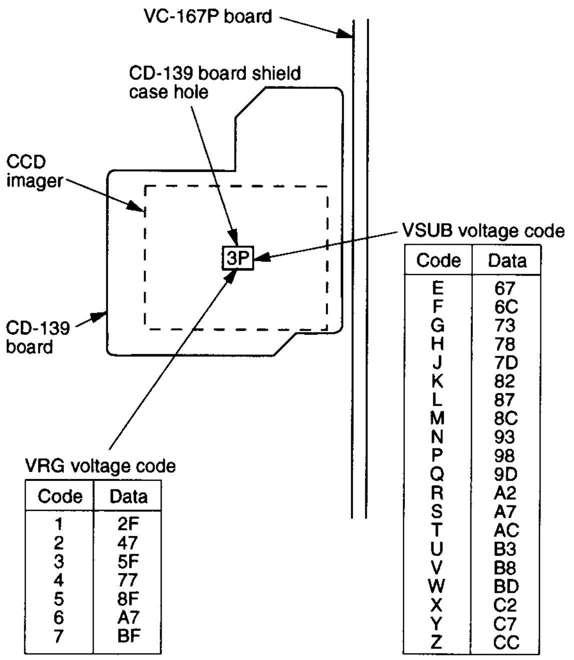
Subject	Not required
Adjustment Page	F
Adjustment Address	26

Related Adjustments:

"MAX gain adjustment", "Auto white balance reference data input", "Auto white balance adjustment", "Color reproductivity adjustment".

Adjustment method:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	26		Reading a voltage code of V SUB indicated by CCD imager then input data of a table (Fig.6-1-7)
3	F	26		Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)



VRG voltage code

Code	Data
1	2F
2	47
3	5F
4	77
5	8F
6	A7
7	BF

VSUB voltage code

Code	Data
E	67
F	6C
G	73
H	78
J	7D
K	82
L	87
M	8C
N	93
P	98
Q	9D
R	A2
S	A7
T	AC
U	B3
V	B8
W	BD
X	C2
Y	C7
Z	CC

Fig 6-1-7

6. VRG adjustment

Subject	Not required
Adjustment Page	F
Adjustment Address	27

Adjustment method:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	27		Reading a voltage code of V SUB indicated by CCD imager then input data of a table (Fig.6-1-7)
3	F	27		Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

7. Page F data modification

All the data of page F are automatically initialized if the initialization is executed. However, among the initialized data, the following addresses require manual modification of data after the page F data is initialized.

Modification procedure:

Order	Page	Address	Data		Procedure
			X24 model	X48 model	
1	6	00	01		After setting the data, Press the PAUSE button. (Preparation)
2	F	03	24	25	Set each data to each address, and press the PAUSE button.
		04	—	54	
		07	—	06	
		08	—	D4	
		54	—	AA	
		5E	—	24	
		61	—	A5	
		63	—	82	
		64	—	36	
		89	—	3A	
		8B	D0	D0	
		E4-EF	00	00	
		F5	A8	A8	
		F6	5E	5E	
		F7	—	C0	

8. 28 MHz crystal oscillator adjustment

Purpose: Adjusts 28 MHz crystal controlled oscillation for synchronizing clock.

Adjustment error: Loss of synchronization or loss of color

Subject	Note required
Measurement Point	IC201 (54) pin
Measuring Instrument	Frequency counter
Adjustment Page	F
Adjustment Address	25
Specification	4433618.75±17Hz

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	25		Change the data using PLAY, STOP buttons until the frequency satisfies the specification.
3	6	00	00	After setting the data, press the PAUSE button. (End)

Reference: **Conversion between the hexadecimal number and decimal number.**

In some adjustment items, data appears in hexadecimal numbers on the DDS display or on the adjustment remote commander. Maintenance engineers are expected to convert the displayed hexadecimal numbers to the corresponding decimal numbers using the following conversion table. Make a required calculation described in each adjustment item. Then re-convert the result of calculation back from the decimal numbers to the corresponding hexadecimal numbers using the following conversion table.

Hexadecimal-Decimal Conversion Table

Lower digit of hexadecimal / Upper digit of hexadecimal	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (C)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A(A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
①→ B(b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C(C)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D(d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E(E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F(F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note : The characters shown in the parenthesis ( ) shows the display on the adjustment remote commander.
(Example) If the DDS display or the adjustment remote commander shows BD (bd);
Because the upper digit of the hexadecimal number is B (b), and the lower digit is D (d), the meeting point "189" of (1) and (2) in the above table is the corresponding decimal number.

< How to convert the decimal number to hexadecimal number >

The decimal numbers are divided into following three categories. Calculation method is different in three categories respectively.

(1)0~255 → 00h~FFh
(2)256~4095 → 0100h~0FFFh
(3)4096~65536 → 1000h~FFFFh

If the decimal number fall into the category (1);

1) Divide the decimal number by 16. Result is "A".
2) Take the integer portion of the number "A" as "B".
3) Calculate the equation (A-B) x 16. Result is "C".
4) "B" is the second digit number of the hexadecimal number and "C" is the first digit number of the hexadecimal number. (BC)h

(Example)

If the decimal number is "189";

1) $189 \div 16 = \underline{11}.8125$ ....(A)
↑
2) (B)
3) $(11.8125 - 11) \times 16 = 13$ ....(C)
4) 189 → (BD)h is obtained.

If the decimal number fall into the category (2);

1) Divide the decimal number by 256. Result is "A".
2) Take the integer portion of the number "A" as "B".
3) Calculate the equation (A-B) x 256. Result is "C".
4) Take the integer portion of the number "C" as "D".
5) Calculate the equation (C-D) x 16. Result is "E".
6) "B" is the third digit number, "D" is the second digit number and "E" is the first digit number of the hexadecimal number. (BDE)h

(Example)

If the decimal number is "2100";

1) $2100 \div 256 = \underline{8}.203125$ (A)
↑
2) (B)
3) $(8.203125 - 8) \times 256 \div 16 = \underline{3}.25$ ....(C)
↑
4) (D)
5) $(3.25 - 3) \times 16 = 4$ ....(E)
6) 2100 → (834)h is obtained.

If the decimal number fall into the category (3);

1) Divide the decimal number by 4096. Result is "A".
2) Take the integer portion of the number "A" as "B".
3) Calculate the equation $(A - B) \times 4096 \div 256$. Result is "C".
4) Take the integer portion of the number "C" as "D".
5) Calculate the equation $(C - D) \times 256 \div 16$. Result is "E".
6) Take the integer portion of the number "E" as "F".
7) Calculate the equation (E-F) x 16. Result is "G". (Round the number "G" to count fractions of 0.5 and over as a unit and cut away the rest.)
8) "B" is the fourth digit number, "D" third digit number, "F" is the second digit number and "G" is the first digit number of the hexadecimal number. (BDFG)h

(Example)

If the decimal number is "31814";

1) $31814 \div 4096 = \underline{7}.7670898$ ....(A)
↑
2) (B)
3) $(7.7670898 - 7) \times 4096 \div 256 = \underline{12}.273436$ ....(C)
↑
4) (D)
5) $(12.273436 - 12) \times 256 \div 16 = \underline{4}.374976$ ....(E)
↑
6) (F)
7) $(4.374976 - 4) \times 16 = 5.999616$
(Round the number to count fractions of 0.5 and over as a unit and cut away the rest.)
↓
8) 6...(G)
9) 31814 → (7C46)h is obtained.

< How to convert the hexadecimal number to decimal number >

If the hexadecimal number is (ABCD)h, the decimal number is calculated by the following equation.

$(A \times 4096) + (B \times 256) + (C \times 16) + (D \times 1) =$ decimal number

(Example) If the hexadecimal number is "(3BA4)h":

$(3 \times 4096) + (11 \times 256) + (10 \times 16) + (4 \times 1) = 15268$

9. HALL adjustment

Purpose: Variation of the HALL element outputs is removed by adjusting amplifier gain and offset. The HALL elements detect the lens iris position.

Adjustment error: Oscillation of lens iris, or incorrect white balance indoor and outdoor.

Subject	Not required
Measurement Point	DDS display on the EVF or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	2A 2B
Specification	13 to 17h when iris is opened. 77 to 7Bh when iris is closed.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	02	21	After setting the data, press the PAUSE button.
3				Turn off the UNREG power supply once, then turn it on.
4	6	00	01	After setting the data, press the PAUSE button.
5	6	02	03	After setting the data, press the PAUSE button.
6	6	01	03	After setting the data, press the PAUSE button.
7	F	2A	40	After setting the data, press the PAUSE button. Read the data appearing on the DDS display note. The read-out data is W_2.
8	F	2A	30	After setting the data, press the PAUSE button. Read the data appearing on the DDS display note. The read-out data is W_1.
9	6	01	01	After setting the data, press the PAUSE button.
10	F	2A	30	After setting the data, press the PAUSE button. Read the data appearing on the DDS display note. The read-out data is K_1.
11	F	2A	40	After setting the data, press the PAUSE button. Read the data appearing on the DDS display note. The read-out data is K_2.
12				Convert the data W1, W2, K1 and K2 into the decimal numbers. The result decimal numbers are W1', W2', K1' and K2'. (Use the < How to convert the hexadecimal number to decimal number > or "Hexadecimal-Decimal Conversion Table".Calculate the following equation (decimal number calculation) to obtain X1'.
13				$A' = W_2' + K_1' - W_1' - K_2'$ ....equation 1 $B' = W_1' - K_1'$ ....equation 2 $X_1' = \frac{1600 + (48 \times A') - (16 \times B')}{A'}$ ....equation 3
14				Convert the decimal number X_1' to the hexadecimal number to obtain X_1. (Round the number X_1 to count fractions of 0.5 and over as a unit and cut away the rest.)
15	F	2A		Set the data X_1 (obtained at step 14).
16				Press the PAUSE button.
17	F	2B		Change the data using the PLAY and STOP until 15 appears on the DDS display.
18				Press the PAUSE button.
19	6	01	03	After setting the data, press the PAUSE button.
20				If the DDS display shows the data in the range from 77 to 7B, it indicates the end of adjustment, and proceed to the item "Processing after Adjustments". If it is not, use the DDS display data as W0 and proceed to step 21 and followings.

Note: Lower two digits of the data which is displayed at the right bottom of he EVF or TV monitor

Order	Page	Address	Data	Procedure
21				Convert the value W_0 to a decimal value to obtain the value W_0'.
22				Calculate the value X_2' from the following equation (decimal calculation). $C' = W_0' + K_1' - W_1' - 20$ ....equation 4 $X_2' = \frac{(100-B')\times(X_1'-48)+(48\times C')}{C'}$ ....equation 5 (The values X_1' and B' are obtained from the equations 2 and 3 in step 13.)
23				Convert the value X_2' to a hexadecimal number to obtain X_2. (Round the number X_2 to count fractions of 0.5 and over as a unit and cut away the rest.)
24	F	2A		Set the data X_2 (which is the result of calculation in step 23).
25	F	2A		Press the PAUSE button.
26	F	2B		Change data using PLAY and STOP button until 79 appears on the DDS display.
27	F	2B		Press the PAUSE button.
28	6	01	01	After setting the data, press the PAUSE button.
29				Confirm that the DDS display shows the data in the range from 13 to 17.

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	02	00	After setting the data, press the PAUSE button.
2	6	01	00	After setting the data, press the PAUSE button.
3	F	02	00	After setting the data, press the PAUSE button.
4				Turn off the UNREG power supply once, then turn it on.
5	6	00	00	After setting the data, press the PAUSE button. (End)

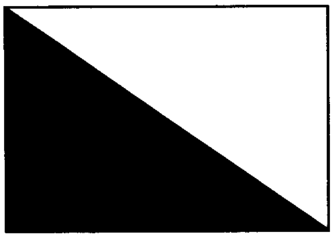
Related adjustments:

"IRIS IN/OUT adjustment"

10. Flange back adjustment

Purpose:	Automatic flange back adjustment of inner focus lens.
Adjustment error:	Loss of focus when switched between auto focus and manual focus.

Subject	Chart for flange back adjustment (Placed 2000 ±5 mm in front of the lens with illumination of 300 ±50 lux.)
Measurement Point	Confirm focus on monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	3C 3D 3E 3F 40 41



(Chart for flange back adjustment)
(See Page 6-2)

Note: Confirm that the "Digital Zoom" is turned OFF.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Check that the center of the flange back adjustment chart coincides with that of the display on the monitor at both ends: TELE end and the WIDE end of the zoom lens.
2	6	00	01	After setting the data, press the PAUSE button. (Preparation)
3				Confirm that the data at page F, address 1B is the initial value, referring to the "Page F address list".
4	6	11		Confirm that the data is 00.
5	6	43	01	After setting the data, press the PAUSE button.
6	6	01	13	After setting the data, press the PAUSE button.
7	6	01	15	After setting the data, press the PAUSE button. The adjustment data is automatically input to page: F, addresses: 3C to 41.
8	6	11		Confirm that the data is 01.
9	6	43	00	After setting the data, press the PAUSE button.

Processing after Adjustments:

Order	Procedure
1	Turn the main power supply (7.2 V) OFF, then ON. (If this step is not performed, the camera will be out of focus.)

11. Flange back check

Subject	Siemens star (Placed 2000 ±5 mm in front of the lens with illumination of about 200 lux.)
Measurement Point	Confirm focus on monitor TV
Measuring Instrument	
Specification Value	Picture must have good focus at both TELE and WIDE ends.

Note 1: Confirm that the "Digital Zoom" is turned OFF.

Note 2: It is judged from the page A display on the adjustment remote commander if the picture has good focus while the auto focus is ON.

1) Set data: 0B to the page:6, address: 02.
2) Focus condition can be known from the page A display.

A: 00 : XX

→ odd number: Picture is in focus.
→ even number: Picture is out of focus.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Place a Siemens star at 2 meters in front of lens.
2				Decrease illumination to the chart down to a point before noise appears on monitor TV, in order to fully open the IRIS.
3	6	43	01	After setting the data, press the PAUSE button.
4				Shoot the Siemens star at TELE end.
5				Confirm that the image is in focus. (Note2).
6	6	21	10	After setting the data, press the PAUSE button.
7				Shoot the Siemens star at WIDE end.
8				Confirm that the image is in focus.

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	02	00	After setting the data, press the PAUSE button.
2	6	21	00	After setting the data, press the PAUSE button. (END)
3	6	43	00	After setting the data, press the PAUSE button.

12. Picture frame setting

Subject	Color bar chart standard picture frame
Measurement Point	VIDEO output terminal (Terminated in 75 Ω)
Measuring Instrument	Oscilloscope and monitor TV
Specification Value	A=B, C=D, t=0 ± 0.1msec

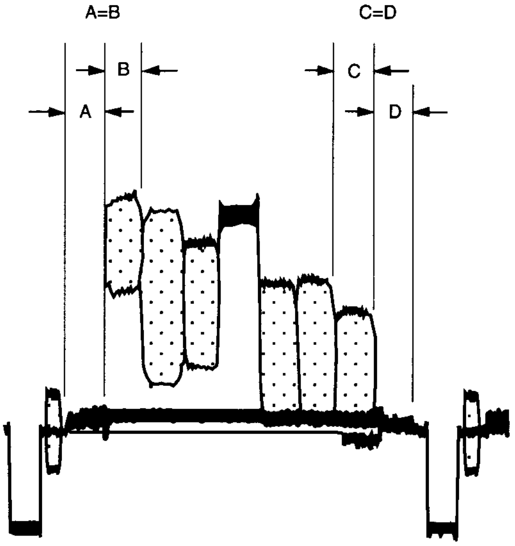
Note : Confirm that the "Digital Zoom" is turned OFF.

Setting procedure:

Order	Procedure
1	Turn OFF the auto focus.
2	Adjust the focus using the focus knob.
3	Adjust direction and zoom of camera so that the picture frame is adjusted as specified by Fig. 6-1-8 and Fig. 6-1-9.
4	Write down markings on the picture frame on the monitor screen. If the "color bar chart standard picture frame" or "white pattern standard picture frame" is specified in the following adjustment items, obtain this picture frame.

Confirm with an oscilloscope

1. Horizontal rate



2. Vertical rate

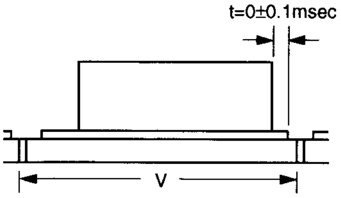


Fig. 6-1-8

Confirm on TV monitor (underscanned display)

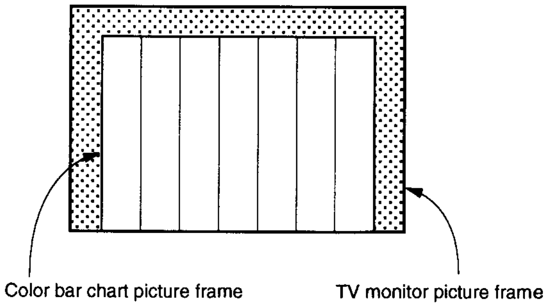


Fig. 6-1-9

13. Color reproduction adjustment

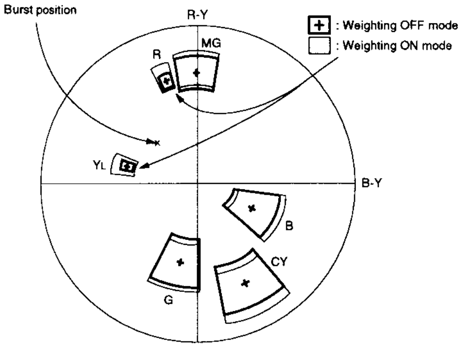
Purpose:	Adjust the three primary color matrix coefficients for correct color reproduction.
Adjustment error:	Poor color reproduction.

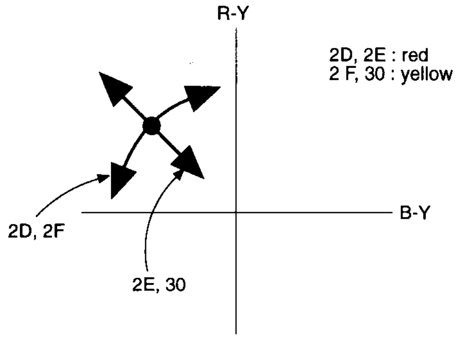
Subject	Color bar chart standard picture frame
Measurement Point	VIDEO output terminal (Terminated in 75 Ω)
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	2D, 2E, 2F, 30
Specification Value	Each spot must be located within the specified color reproduction zone on a vectorscope display.

Note : Confirm that the "Digital Zoom" is turned OFF.

Adjustment procedure:

Order	Page	Address	Data	Procedure	Condition
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)	
2	6	03	00	After setting the data, press the PAUSE button. (Setting)	
3	6	01	37	After setting the data, press the PAUSE button.	
4	F	2D, 2E 2F, 30		Change the data so that each spot must be located within the specified color reproduction zone on a vectorscope display. Press the PAUSE button for each address.	Weighting OFF mode.





Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2	6	03	10	After setting the data, press the PAUSE button. (Setting)
3	6	42	00	After setting the data, press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

Related Adjustments:

"Auto white balance reference data input"

"Auto white balance adjustment"

14. IRIS IN/OUT adjustment

Purpose: Measure the light level and write into EE PROM for indoor/outdoor identification in auto white balance.

Adjustment error: Incorrect white balance.

Subject	White pattern standard picture frame
Measurement Point Measuring Instrument	EVF or DDS display of monitor TV
Adjustment Page	F
Adjustment Address	3A 3B

Note : Confirm that the "Digital Zoom" is turned OFF.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	02	21	After setting the data, press the PAUSE button.
3				Turn off tje UNREG power supply once, then turn it on.
4	6	00	01	After setting the data, press the PAUSE button.
5	6	11		Confirm that the date is 00,,
6	6	01	4B	After setting the data, press the PAUSE button.
7	6	01	49	After setting the data, press the PAUSE button.
8	6	11		If data is 01, this is the end of data read.

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2	F	02	00	After setting the data, press the PAUSE button.
3				Turn off tje UNREG power supply once, then turn it on.
4	6	00	00	After setting the data, press the PAUSE button. (End)

The page: A data appears on DDS of monitor TV.

15. MAX gain adjustment

Purpose: Sets the minimum illumination level.

Adjustment error: Normal video level cannot be obtained at low illumination (dark).

Subject	White pattern standard picture frame
Measurement Point	VIDEO output terminal (Terminated in 75 Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	2C
Specification Value	A =600 ± 10 mV

Note : Confirm that the "Digital Zoom" is turned OFF.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	01	19	After setting the data, press the PAUSE button.
3	F	2C		Change data using PLAY and STOP buttons so that the Y signal level (A) satisfies the specification. The data which satisfies the Y signal level (A) is called "D2c".
4	F	2C		Set the data "D2c" and press the PAUSE button.

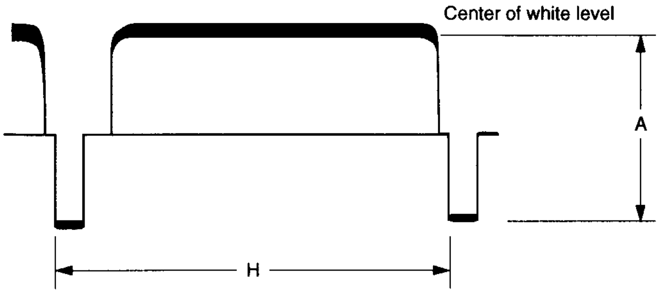


Fig. 6-1-10.

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2	6	00	00	After setting the data, press the PAUSE button. (End)

16. Auto white balance reference data input

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	33, 34, 35, 36

Note 1: Confirm that the "Digital Zoom" is turned OFF.

Note 2: The "Color reproduction adjustment" must have been completed before making this adjustment.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Turn the main power OFF then to ON.
2				Shoot a white pattern with the standard picture frame.
3	6	00	01	After setting the data, press the PAUSE button.
4	6	11		Confirm that data is 00.
5	6	01	11	After setting the data, press the PAUSE button.
6	6	01	0D	After setting the data, press the PAUSE button. (Executes the auto white balance reference data input.)
7	6	11		If data is 01, this is the end of data read.

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2				Execute "Auto white balance adjustment".
3	6	00	00	After setting the data, press the PAUSE button. (End)

Related Adjustments:

Auto white balance adjustment

17. Auto white balance adjustment

Purpose: Adjust for correct auto white balance.
Adjustment error: Poor color reproduction.

Subject	White pattern standard picture frame
Filter	Color temperature correction filter C14
Measurement Point Measuring Instrument	EVF or DDS display on monitor TV
Adjustment Page	F
Adjustment Address	38 39
Specification Value	R ratio 2A80±40h B ratio 5E80±80h

Note 1: Make this adjustment after "Auto white balance reference data input" is completed.
Note 2: Confirm that the "Digital Zoom" is turned OFF.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation 1)
2	F	02	21	After setting the data, press the PAUSE button. (Preparation 2)
3				Turn off the UNREG power supply once, then turn it on.
4	6	00	01	After setting the data, press the PAUSE button.
5	6	01	35	After setting the data, press the PAUSE button.
6	6	02	04	After setting the data, press the PAUSE button. Sets the R ratio display mode.
7	F	38		Change data using the PLAY and STOP buttons until the R ratio data on the DDS display becomes the specification value. R ratio data = 2000h+10h×D_{F5} (D_{F5} = Page F, Address: F5 data)
8	6	02	05	After setting the data, press the PAUSE button. Sets the B ratio display mode.
9	F	39		Change data using the PLAY and STOP buttons until the B ratio data on the DDS display becomes the specification value. B ratio data = 80h+100h×D_{F6} (D_{F6} = Page F, Address: F6 data)
10				Press the PAUSE button.

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2	6	02	00	Releases the B ratio display mode.
3	F	02	00	After setting the data, press the PAUSE button. (End 2)
4				Turn off the UNREG power supply once, then turn it on.
5	6	00	00	After setting the data, press the PAUSE button. (End 1)

18. White balance check

Subject	White pattern standard picture frame
Filter	Color temperature correction filter C14
	ND filter 1.0 and 0.3
Measurement Point	VIDEO output terminal (Terminated in 75 Ω)
Measuring Instrument	Vectorscope
Specification Value	Fig. 6-1-11. A ~ C

Note : Confirm that the "Digital Zoom" is turned OFF.

Check procedure:

Order	Page	Address	Data	Procedure	Condition
1				Check that the lens is not covered by either filter.	
2	6	01	0F	After setting the data, press the PAUSE button.	
3				Check that the white luminance point is located within the circle shown in Fig. A.	Without filter.
4	6	01	00	After setting the data, press the PAUSE button.	
5	6	01	23	After setting the data, press the PAUSE button.	
6				Put the C14 filter on the lens.	
7				Check that the white luminance point is located within the circle shown in Fig. B.	C14 filter.
8				Remove the C14 filter and put ND filter 1.3 (1.0 + 0.3) on the lens.	
9				Check that the white luminance point is located within the circle shown in Fig. C.	ND Filter 1.3

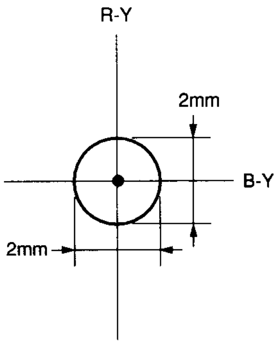


Fig. 6-1-11. A

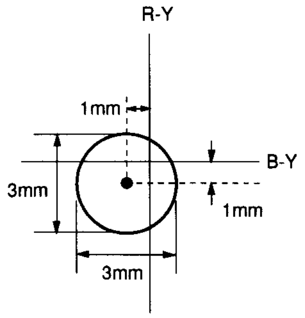


Fig. 6-1-11. B

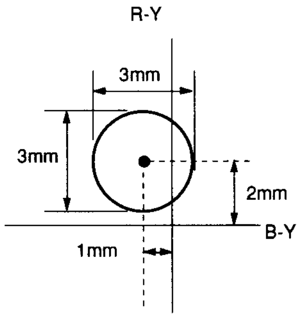


Fig. 6-1-11. C

Processing after Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	After setting the data, press the PAUSE button.
2	6	00	00	After setting the data, press the PAUSE button. (End)

19. Electronic viewfinder system adjustments (VF-93P, VF-94P board)

There are no adjustment point in color viewfinder circuit board. If any circuit board becomes defective, exchange the circuit board. When exchanging circuit board, exchange the VF-93P, VF-94P and LB-44 boards as a pair at the same time.

Note 1: The backlight (fluorescent lamp is driven by a 700 Vp-p, 62 kHz AC power supply.
Therefore, be careful not to touch the back light holder with hand or you will receive an electric shock.

Note 2: When replacing the LCD unit, be careful not to damage the LCD unit with static electricity.

[Adjustment connector]

Most measurement points of the viewfinder check are concentrated at the CPC of the VF-94P board. Connect the measuring equipment to the CPC via the measuring pin tool. The following table shows the pin numbers and signal names of the CPC.

CN902 (VF-94P BOARD)

Pin No.	Signal name	Pin No.	Signal name
1	LC COM	2	EVF GND
3	G OUT	4	13.5V
5	NC	6	12V
7	R OUT	8	B OUT
9	SLYT	10	PCO

Measuring pin tool for LCD   Parts code: J-6082-192-A

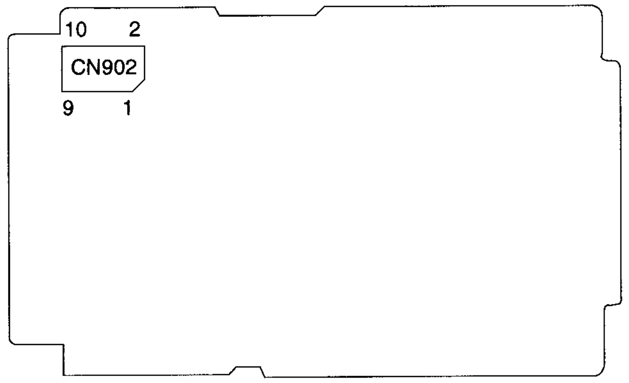
[Power supply voltage check]

Adjust the power supply voltage to be input to the battery terminal so that the voltage across VF-93P board CN851 pins ⑦ (EVF UNREG) and pins ⑩ (EVF GND) is 7.2±0.1 Vdc.

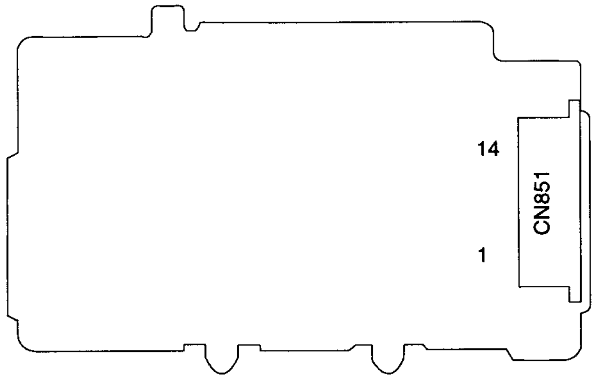
Power supply voltage check (VF-93P board)

Subject	Any subject
Measuring Instrument	Digital voltmeter
EVF 4.9V	
Measurement Point	CN851 Pin ⑨
Specification Value	4.8±0.1Vdc
EVF 15V	
Measurement Point	CN851 Pin ⑧
Specification Value	15±0.2Vdc

VF-94P BOARD (SIDE A)

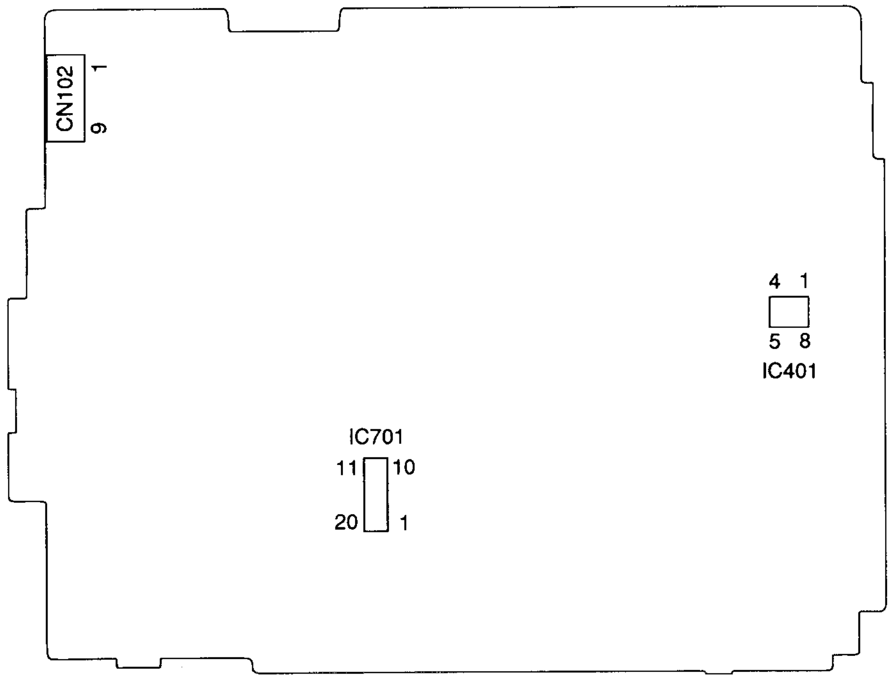


VF-93P BOARD (SIDE A)

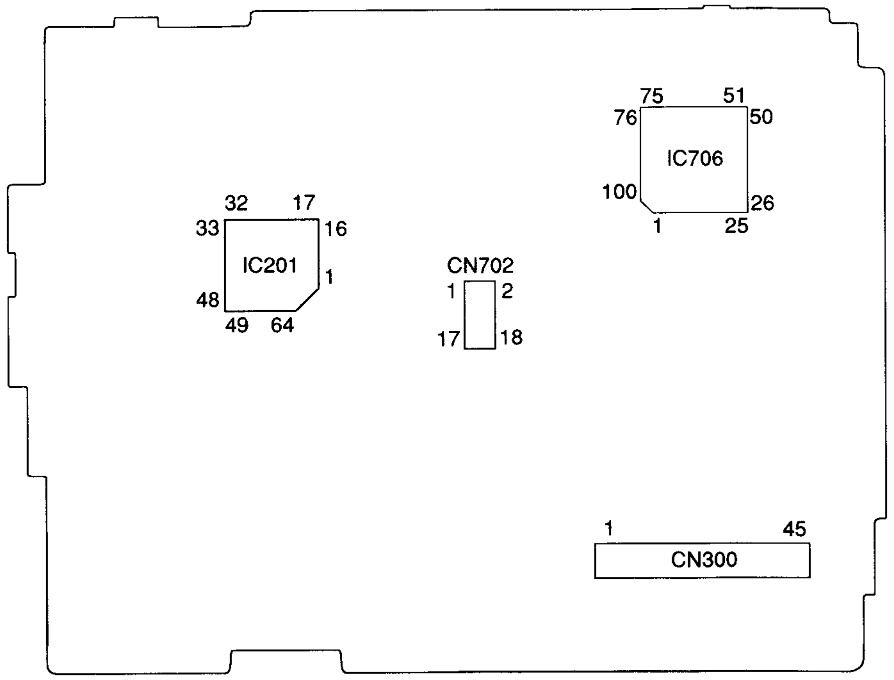


ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

VC-167P BOARD (SIDE A)



VC-167P BOARD (SIDE B)



6-2. MECHANISM SECTION ADJUSTMENTS

Refer to the separate “8 mm Video Mechanism Section Adjustment Manual Ⅶ B Mechanism ” for adjustment, check procedure and mechanical parts replacement.

2-1. HOW TO OPERATE THE MECHANISM AFTER THE CASSETTE COMPARTMENT IS REMOVED

1. How to load a cassette tape:

1) Refer to “1. Disassembly” and turn the main power on with the cabinet and camera section removed. (It enables to operate the mechanical deck.)
2) Connect the adjustment remote commander and set the NORM - ADJUST (HOLD) switch to ADJUST (ON) position.
3) Check that the main power is being supplied.
4) Select page: 6, address: 00, set data :01 and press the PAUSE button.
5) Select page: F, address: 02, set data: 01 and press the PAUSE button.
6) Turn off the power supply once, then turn it on.
7) Set the NORM - ADJUST (HOLD) switch to NORM (OFF) position. (The adjustment remote commander can be disconnected hereafter.)
8) Press the push-switch-1 knob in the direction of arrow which sets the machine into loading mode.

★ PB, FF/REW and CUE/REV operations are possible.

9) After completing all steps of above operation, be sure to perform “4. Processing after operation”.

2. How to establish RECORD mode:

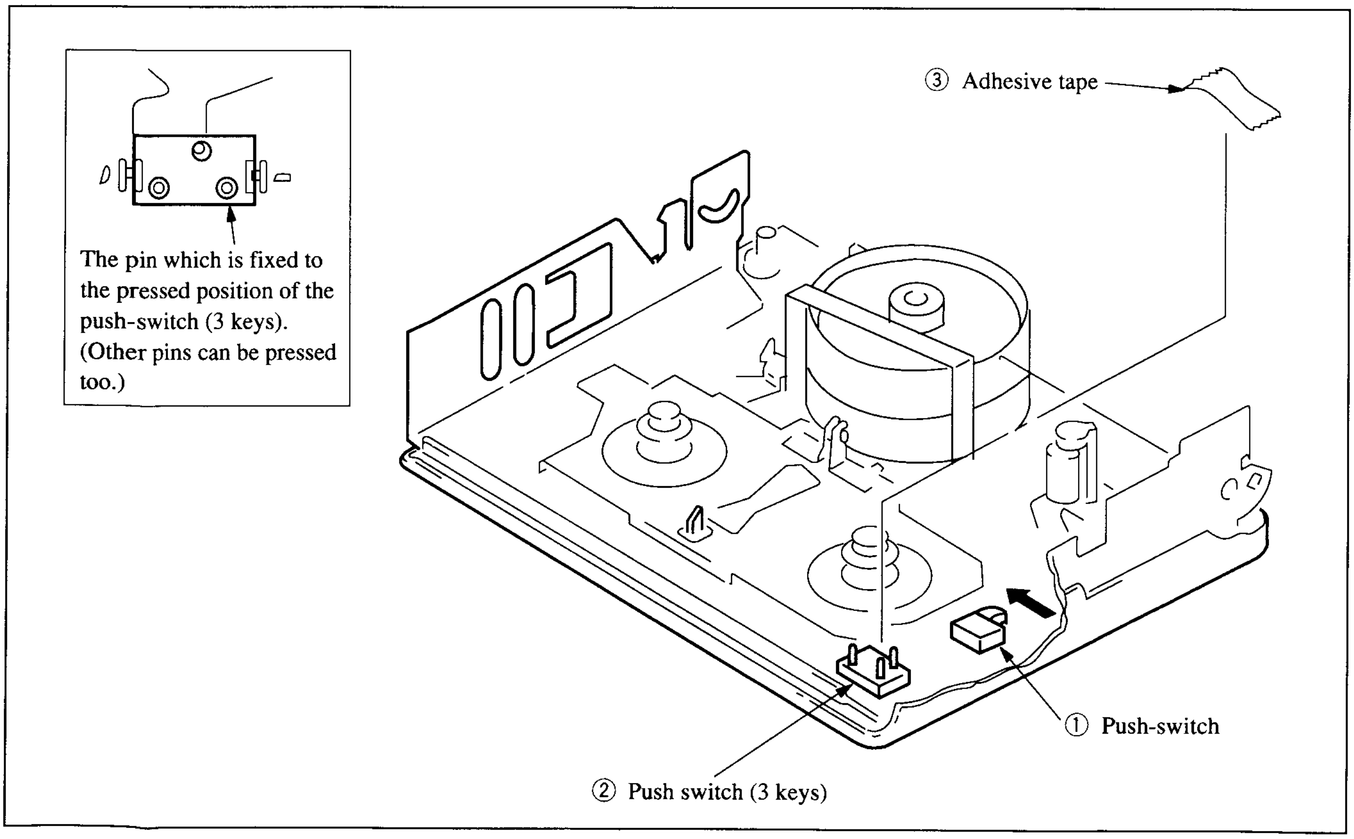
1) Press pin of the push-switch 2 (ON state) and keep the ON state by fixing with adhesive tape.
2) Turn the main power switch ON (select VTR or CAMERA position of camera).
3) Set the RECORD switch to ON.
   (When the test mode is selected, the rotation detection of the S and T reel tables is muted, and the top end sensor is disable which allow to run the tape.)

3. How to eject a cassette tape:

1) Press the EJECT switch to ON.

4. Processing after operation

1) Connect the adjustment remote commander and set the NORM - ADJUST (HOLD) switch to ADJUST (ON) position.
2) Select page 6, address: 00, set data: 01 and press the PAUSE button.
3) Select page: F, address: 02, set data: 00 and press the PAUSE button.
4) Remove the power supply to the machine.



The pin which is fixed to the pressed position of the push-switch (3 keys). (Other pins can be pressed too.)

2-2. TAPE PATH ADJUSTMENT

Purpose: Adjusts the head linearity.

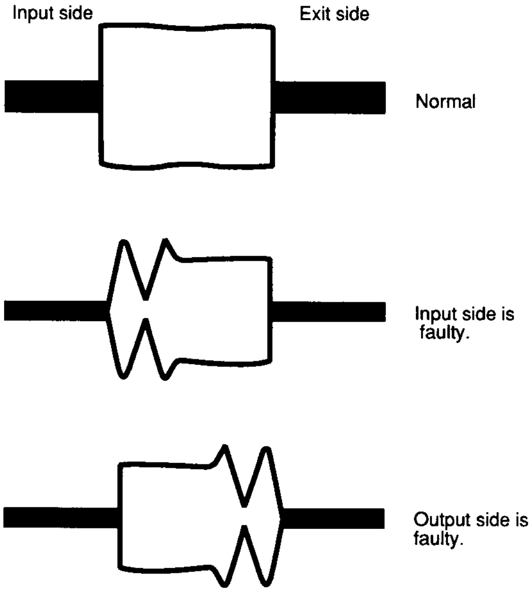
Adjustment Error: Noise appears on top and bottom of display when playing back the tape recorded by other machines.

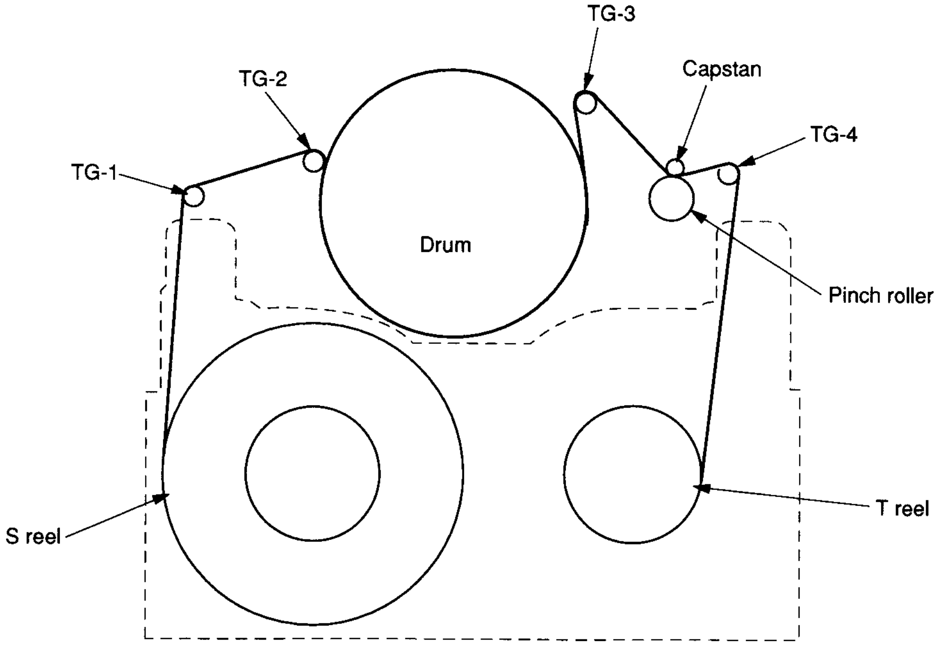
1. Preparations for adjustments

1) Clean the tape running surface (tape guide, drum, capstan, pinch roller).
2) Connect the adjustment remote commander to the REMOTE terminal (JACK block).
3) Set the NORM - ADJUST (HOLD) switch to ADJUST (ON) position.
4) Check that the main power is being supplied.
5) Select page: 6, address: 00, set data :01 and press the PAUSE button.
6) Select page: F, address: 02, set data: 03 and press the PAUSE button.
7) Turn off the power supply once, then turn it on.
8) Connect an oscilloscope.
   CH1: VC-167P board CN102 pin ①.
   External trigger: VC-167P board CN102 pin ⑧.
9) Playback the tracking alignment tape (WR5-1CP).
10) Check to see that RF waveform is flat at input and exit sides on oscilloscope.
   If it not flat. Tape Path Adjustment" of the 8 mm Video Mechanism Section Adjustment Manual Ⅶ [B Mechanism].
11) After completing the adjustment, perform "2-1-4. Processing after operation".

VC-167P board CN102

1	PB RF
2	REC 2
3	GND
4	EMPH IN
5	CAM Y IN
6	DEEMPH OUT
7	BPF ADJ
8	RF SWP
9	CAP FG





6-3. VIDEO SECTION ADJUSTMENT

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 6-64.

Perform the video section adjustment in the sequence as described.

[Adjustment sequence]

1) Servo system adjustment
    1.SYNC LEVEL/BURST LEVEL adjustment.
    2.Switching position adjustment
    3.Capstan FG offset adjustment
2) Playback frequency response characteristics adjustment
3) DEMD OUT adjustment
4) YD OUT LEVEL adjustment
5) Chroma level check
6) PB Y level adjustment
7) FE OSC check
8) Emphasis input level adjustment
9) Y FM deviation adjustment
10) Y FM carrier frequency adjustment
11) Chroma emphasis fo adjustment
12) REC Y level adjustment
13) REC L level adjustment
14) REC C level adjustment

3-1. PREPARATIONS BEFORE ADJUSTMENT

The following measuring equipment are used for video section adjustment.

3-1-1. Equipment required

1) Monitor TV
2) Oscilloscope, dual trace, 30 MHz bandwidth or more with delay mode function.
   (Use 10:1 probe unless otherwise specified.)
3) Frequency counter
4) Digital voltmeter
5) Audio generator
6) Audio level meter
7) Audio distortion meter
8) Audio attenuator
9) Regulated power supply
10) alignment tape
   - For tracking adjustment (WR5-1CP)
     Parts code: 8-967-995-07
   - For normal mode video frequency response adjustment (WR5-6C)
     Parts code: 8-967-995-17
   - For confirmation of normal mode operation
     for SP (WR5-5CSP)
     Parts code: 8-967-995-47
     or (WR5-4CSP)
     Parts code: 8-967-995-46
     for LP (WR5-4CL)
     Parts code: 8-967-995-56
   - For checking AFM stereo operations
     WR5-9CS
     parts code: 8-967-995-28

3-1-2. Precautions on adjustment

The EVF (electronic viewfinder) is not necessary for video section adjustment.
Remove the following connector to remove the EVF.
1. CF-40 board CN481 (pin-8)

The audio board (MA-238) board is not necessary except for "Audio System Adjustments". Remove the following connectors.
1. VC-167P board CN060 (pin-12)

After completing all adjustments, release the adjustment mode by either of the following two methods.

1) Remove the lithium battery. (In this case, data time and menu setting by users are erased. Input these data again.)
2) Return the data of the address: 00 on page:6 to 00. If the page: 2 data is changed, return the data to the original value.

3-1-3. Adjustment connector (VC-167P Board CN102)

Some video section adjustment points are concentrated to the VC-167P board CN102. Connect the measuring equipment via the tool (Multi CPC: J-6082-311-A).

Pin No.	Signal Name
1	PB RF
2	REC 2
3	GND
4	EMPH IN
5	CAM Y IN
6	DEEMPH OUT
7	BPF ADJ
8	RF SWP
9	CAP FG

3-1-4. Equipment connection

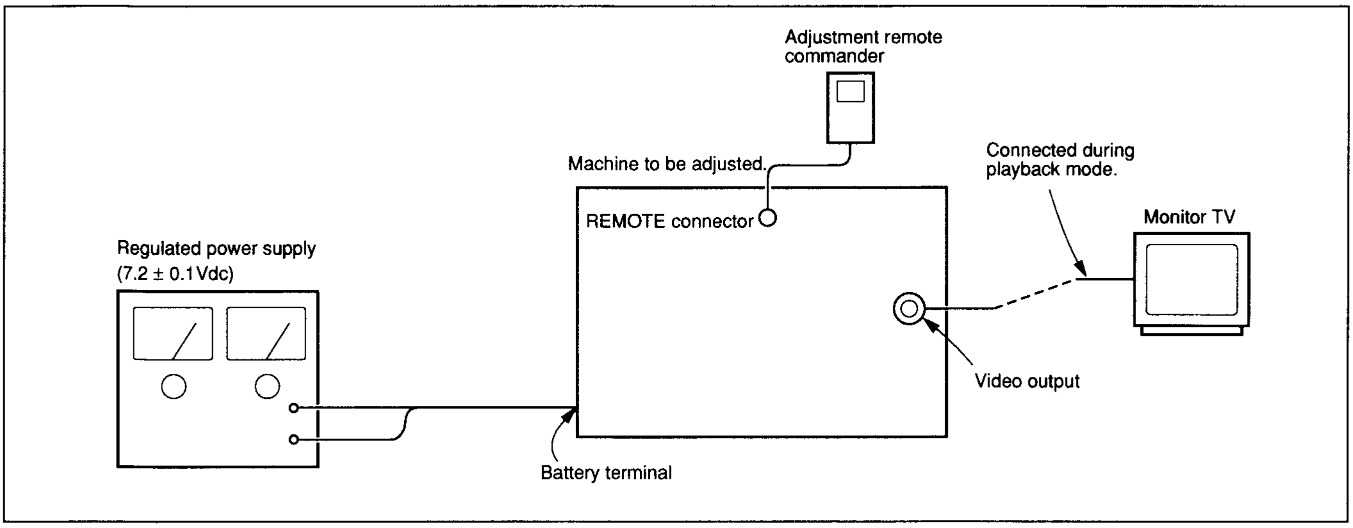

Adjustment remote commander
Machine to be adjusted.
Connected during playback mode.
REMOTE connector
Monitor TV
Regulated power supply (7.2 ± 0.1Vdc)
Video output
Battery terminal

Fig.6-3-1.

3-1-5. Alignment tape

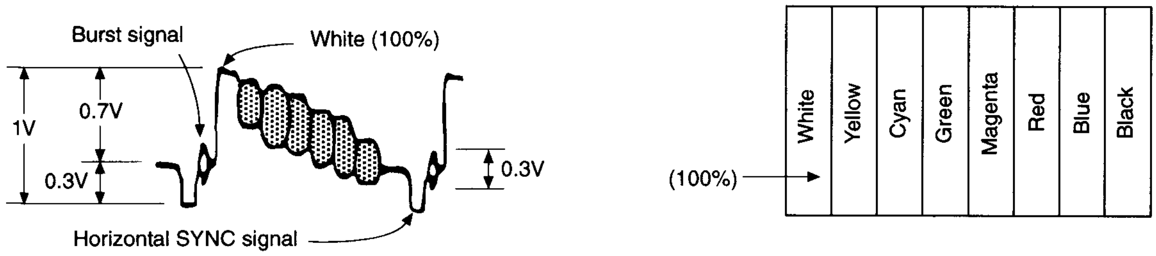
The following table shows the alignment tapes available.
Use the tape specified in the signal column for each adjustment.
If tape type is not specified in the adjustments which use the "Operation Check" tape, use any type of tape for the checking purpose.

Name	Record Mode	Tape Type	Tape Speed	Use
Tracking WR5-1CP	Normal	MP	SP	Tape path adjustment Switching position adjustment
Video frequency response adjustment WR5-6C	Normal	MP	SP	Frequency response adjustment
Operation check (SP mode) WR5-5CSP	Normal	MP	SP	Operation check
Operation check WR5-4CL	Normal	MP	LP	
AFM stereo checking operations WR5-9CS	Normal	MP	SP	AFM stereo checking operations

Note: Tape type
MP — Metal particle tape

The color bar signal which is recorded in the alignment tape.

Note: Measured at video input/output connector (across 75 Ω termination).


Burst signal
White (100%)
1V
0.7V
0.3V
0.3V
Horizontal SYNC signal
(100%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
Black

Color bar signal waveform

Color bar pattern

Color bar signal of alignment tape

3-1-6. Output level and impedance

Video output	Pin jack Output signal: 1 V p-p, 75 Ω unbalanced, sync negative
Audio output	Pin jack Input level: -7.5 dBs (across 47 kΩ load)) Output impedance: 2.2 kΩ or less

3-2. ADJUSTMENT POINTS WHEN MAJOR PARTS ARE REPLACED

1. When drum is replaced:

"Tape Path Position Adjustment" of mechanical section adjustment

"PB RF frequency response characteristics adjustment" of the video section adjustment

"Switching position adjustment" of the servo section adjustment

3-3. POWER SUPPLY SYSTEM ADJUSTMENT

1. Power supply voltage check (VC-167P board)

Mode	Camera record
Subject	Any subject
Measuring Equipment	Digital voltmeter
MT5V check	
Measuring Point	CN300 pin㊱
Specification Value	5.0 ± 0.15Vdc
DIG 3V check	
Measuring Point	CN300 pin㉚
Specification Value	3.16 ± 0.1Vdc
AU 3 V check	
Measuring Point	CN501 pin⑤
Specification Value	3.18 ± 0.1Vdc
EVF 5V check (camera mode)	
Measuring Point	CN300 pin㊶
Specification Value	4.85 ± 0.15Vdc
EVF15 V check	
Measuring Point	CN300 pin㊵
Specification Value	14.95 ± 0.4Vdc

2. VTR & CAM mode ON

Mode	Stop
Signal	Any signal
Adjustment Page	F
Adjustment Address	02

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Set the remote commander (RM-95) to HOLD (adjustment position), and turn on the UNREG power supply.
2	6	00	01	After setting the data, press the PAUSE button. (Preparation)
3	F	02	03	After setting the data, press the PAUSE button.
4				Turn off the UNREG power supply once, then turn it on.

How to cancel the VTR &CAM mode ON.

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button.
2	F	02	00	After setting the data, press the PAUSE button.
3				Turn off the UNREG power supply once, then turn it on.

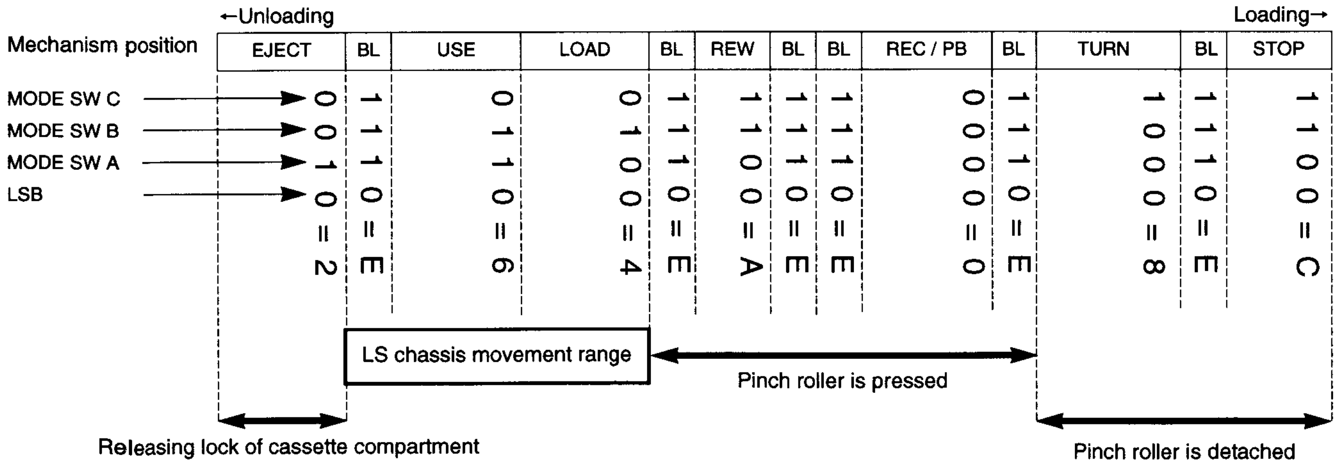
3. EMG code (Emergency code)

The emergency codes are stored in the addresses: E4, E8 and EC corresponding to the type of errors occurred. Types of error code are shown in the following table.

Code	Error Status
00	No error
10	Loading motor error during loading
11	Loading motor error during unloading
20	T reel error during unloading
21	S reel error during unloading
22	T reel error in normal mode
23	S reel error in normal mode
30	FG error during capstan startup
31	FG error during capstan normal speed
40	FG error during drum startup
41	PG error during drum startup
42	FG error during normal rotation of drum
43	Not used
44	Phase error during normal rotation of drum

4. MSW code

- The lower digit data of the page F: address: E6, EA and EE indicate the MSW code (mode switch code) when an error occurs.
- The upper digit data of the page F: address: E6, EA and EE indicate the MSW code (mode switch code) of mode transition (mode SW code before mode transition) when an error occurs.
- The lower digit data of the page F: address: E7, EB and EF indicate the MSW code (mode switch code) of transition target (code to which the machine is going to enter) when an error occurs.

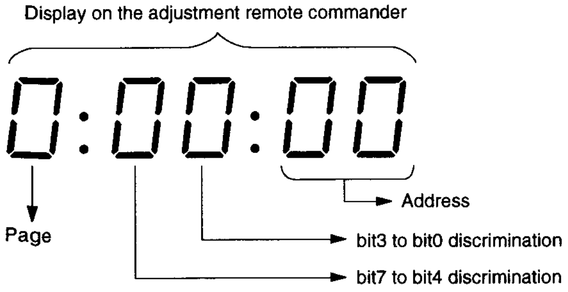


Mechanism position	EJECT	BL	USE	LOAD	BL	REW	BL	BL	REC / PB	BL	TURN	BL	STOP
MODE SW C	0	1	0	0	1	1	1	1	0	1	1	1	1
MODE SW B	0	1	1	1	1	1	1	1	0	1	0	1	1
MODE SW A	1	1	1	0	1	0	1	1	0	1	0	1	0
LSB	0	0	0	0	0	0	0	0	0	0	0	0	0
	= 2	= E	= 6	= 4	= E	= C	= E	= E	= 0	= E	= 8	= E	= C

Mechanism Position	MSW Code	Detail of Content
EJECT	2	The position where the cassette compartment lock is released.The end position in the unthread-end direction. The mechanism does not move any more in the direction of unloading direction.
BL	E	Blank code. The code which separates a code from another code. The machine does not stop at the code while is it operating.
USE	6	EJECT completed position. If a cassette is ejected, it stops at this position. If mechanism moves in the loading direction, the TG1 guide and the TG9 guide start moving.
LOAD	4	The code during loading and unloading. This code is output while the LS chassis is moving.
REW	A	REW position. The position to activate the REW and FR/REV.
RP	0	PB, REC, CUE REV and PAUSE position. The pinch roller is pressed and the tension regulator is turned ON.
TURN	8	The position which is used to move the swing gear from S to T or from T to S.Normal STOP position.
STOP	C	The pinch roller is detached, tension regulator is turned OFF, and both reels are braked. Mechanism does not move any more in the loading direction.

5. Bit value discrimination

Bit values must be discriminated using the display data of the adjustment remote commander for the following items. Us the table below to discriminate if the bit value is "1" or "0".


Display on the adjustment remote commander
0:00:00
Address
Page
bit3 to bit0 discrimination
bit7 to bit4 discrimination

(Example) If the remote commander display is "8E", bit value from bit 7 to bit 4 can be discriminated from the column Ⓐ, and those from bit 3 to bit 0 from column Ⓑ.

	Display on the Adjustment Remote Commander	Bit value			
		bit3 or bit7	bit2 or bit6	bit1 or bit5	bit0 or bit4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ	8	1	0	0	0
	9	1	0	0	1
	A(A)	1	0	1	0
	B(b)	1	0	1	1
	C(C)	1	1	0	0
	D(d)	1	1	0	1
Ⓑ	E(E)	1	1	1	0
	F(F)	1	1	1	1

6. Initializing the emergency code area

(Caution) Perform the initializing operation only when the past emergency codes can be deleted.

Operating procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	11	00	After setting the data, press the PAUSE button.
3	6	01	4D	After setting the data, press the PAUSE button.
4	6	11	01	After setting the data, press the PAUSE button.
5	F	E4~EF	00	After setting the data, press the PAUSE button.
6	6	01	00	After setting the data, press the PAUSE button.
7	6	00	00	After setting the data, press the PAUSE button. (End)

7. LED check

Data	Operation
00	Normal
10	Tally LED lights.

Operating procedure:

Order	Page	Address	Date	Procedure
1				Turn CAM POWER ON.
2				Check LED.
3	2	00	00	After setting the data, press the PAUSE button.
4	2	A0	10	Tally LED light.

8. Key input check

Bit	Key Switch	Switch Condition
0	Date (+)	"1" =OFF "0" =ON
1	Time	
2	Cassette eject	
3	Video power supply	
4	CC DOWN	
5	Start/Stop	
6	Camera power supply	

Operating procedure:

Order	Page	Address	Data	Procedure
1	2	00	3F	After setting the data, press the PAUSE button.
2	2	01		ON/OFF of each key switch can be known by discriminating the bit value of each display data.

9. Key input check (A/D port)

- VC-167P board

Display data / Address	00~20	21~60	61~A0	A1~E0	E1~FF
2E (KEY AD0: IC303 (82))	• STOP (S307)	• REW (S305)	• FF (S306)	• PAUSE (S304)	No key input
2F (KEY AD1: IC303 (83))	• PB (S303)	• EDIT SEARCH (−) (S302)	• EDIT SEARCH (+) (S301)		No key input
30 (KEY AD2: IC303 (84))	COUNTER RESET (CF-40 board S482)	TITLE (CF-40 board S301)			No key input
31 (S/S MODE SW: IC303 (85))	START/STOP MODE (CF-40 BOARD : S485)				NORMAL
	5 SEC REC	▭	⎍		
32 (PROGRAM AE: IC303 (86))	PROGRAM AE (CF-40 BOARD : S489)				No key input
	AE PORTRAIT	AE SPORT	AE SHUTTER	AE TWILIGHT	

Operating procedure:

Order	Page	Address	Data	Procedure
1	2	00	01	After setting the data, press the PAUSE button.
2	2	2E~32		From the display data of each address, it can be known which key is being pressed.

10.Individual operation of drum, capstan and loading motor

Data	Operation
00	Normal
02	Drum rotation in normal direction
06	Capstan rotation in normal direction
08	Capstan rotation in reverse direction
0A	Loading motor rotation in normal direction
0C	Loading motor rotation in reverse direction
01	All motors stop.
03	
05	
07	
09	
0B	
0D	
0F	

Operating procedure:

Order	Page	Address	Data	Procedure
1	7	00	02	After setting the data, press the PAUSE button.
2	7	0E	01	Individual operation of motors is approved.
3	7	11		Motor can be operated individually by setting the above described data.
4				Turn the main power (7.2 V) OFF.

3-4. SERVO SYSTEM ADJUSTMENTS

1. SYNC level and BURST level adjustments

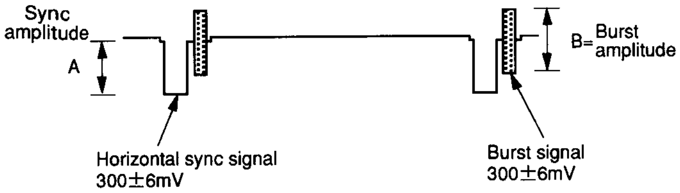
Purpose: Adjust the sync and burst level of the camera output to the specified values.

Adjustment error: The playback machine can lose lock of the servo systems if the sync level is too low. The playback color will become too thick if the burst level is low.

Mode	Camera record
Subject	Color bar chart: standard picture frame
Measurement point	VIDEO output terminal (terminated in 75Ω)
Measuring equipment	Oscilloscope
Adjustment page	F
Adjustment address	28 (SYNC LEVEL) 29 (BURST LEVEL)
Specifications	A = 300 ±6 mV (SYNC LEVEL) B = 300 ±6 mV (BURST LEVEL)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	01	03	After setting the data, press the PAUSE button.
3	F	28		Change the data using the PLAY and STOP buttons until the SYNC LEVEL (A) satisfies the specification.
4				Press the PAUSE button.
5	F	29		Change the data using the PLAY and STOP buttons until the BURST LEVEL (B) satisfies the specification.
6				Press the PAUSE button.
7	6	01	00	After setting the data, press the PAUSE button.
8	6	00	00	After setting the data, press the PAUSE button. (End)



2. Switching position adjustment

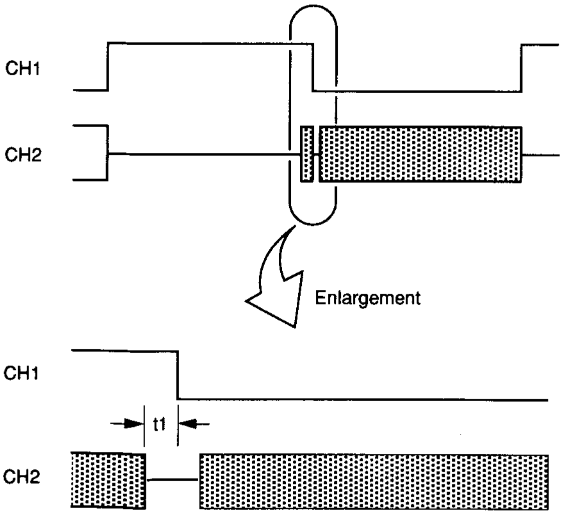
Purpose: Removes vertical mechanical error of head assembling.

Adjustment error: Skew picture.

Mode	Playback
Signal	Alignment tape : For adjustment tracking (WR5-1CP)
Measurement Point	CH1 : ⑧ of CN102 (RF SWP) CH2 : ① of CN102 (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	0A 0B
Specification Value	t1= 0 ± 10 μ sec

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	0B	80	Initial setting.
3	F	0B		Change the data with the PLAY and STOP buttons, and minimize t1.
4				Press the PAUSE button.
5	F	0A		Change the data with the PLAY and STOP buttons, and minimize t1.
6				Press the PAUSE button.
7				Check that tl satisfies the specified value. If not, repeat steps 3 to 6 in order.
8	6	00	00	After setting the data, press the PAUSE button. (End)

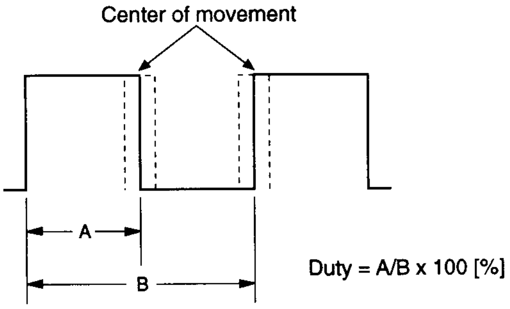


3. Capstan FG offset adjustment

Purpose: Adjusts duty ratio of capstan FG signal

Adjustment error: Jitter can increase.

Mode	CAM-REC (SP)
Signal	Any signal
Measurement Point	CN102 pin⑨
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	12
Specification Value	Duty = 50 ± 1.5%



Adjustment procedure:

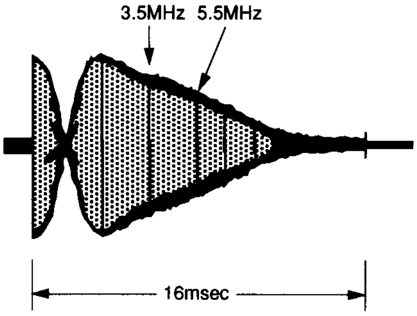
Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	12	80	After setting the data, press the PAUSE button.
3	F	12		Change data using PLAY and STOP buttons so that the duty ratio A/B satisfies the specification.
4				Press the PAUSE button.
5	6	00	00	After setting the data, press the PAUSE button. (End)

3-5. PLAYBACK FREQUENCY RESPONSE CHARACTERISTICS ADJUSTMENT

Purpose: Remove variation of picture quality between heads due to difference of characteristics.

Adjustment error: Flicker or over-modulation of playback picture.

Mode	Playback
Signal	Alignment tape: Normal mode frequency response characteristics adjustment (WR5-6C)
Measurement Point	Check connector (CH1: CN102 pin① (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	22 23
Specification Value	3.5 MHz level : 5.5 MHz level = 4 : (3.0 ±0.2)



Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	22		Change data using PLAY and STOP buttons to adjust the level ration between 3.5 MHz level and 5.5 MHz level of the PB RF waveform of channel "1a" satisfies the specification. Press the PAUSE button. Playback mode.
3	F	23		Adjust the channel "2a" in the same way (address 23). Press the PAUSE button. Playback mode.
4	6	00	00	After setting the data, press the PAUSE button. (End)

3-6. DEMD OUT LEVEL ADJUSTMENT

Purpose: The playback video level is kept to constant level.

Adjustment error: The playback picture can be brighter or darker than normal picture.

Mode	Playback
Signal	Alignment tape : Normal mode (WR5-5CSP)
Measurement Point	IC201 pin⑳ or CN102 pin⑥
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	1D
Specification Value	A=0.50±0.01Vp-p

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	1D		Change data using PLAY and STOP buttons so that the Y signal level (A) satisfies the specification.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)

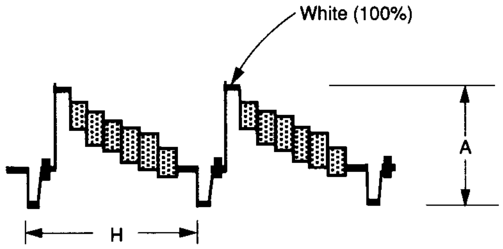


Fig. 6-3-1

3-7. YD OUT LEVEL ADJUSTMENT

Purpose:	Minimizes the residual chroma component of Y comb filter output signal.
Adjustment error:	Chroma flicker at video out (pin jack) of VTR overall characteristics. Color variations also significant.

Mode	Playback
Signal	Alignment tape : Normal mode (WR5-5CSP)
Measurement Point	CN102 pin⑤
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	24
Specification Value	A=0.50±0.01Vp-p

Note : Minimize the residual chroma to the smallest amplitude

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	24		Change data using PLAY and STOP buttons so that the Y signal level (A) satisfies the specification.
3				Press the PAUSE button.
4	1	00	00	After setting the data, press the PAUSE button. (End)

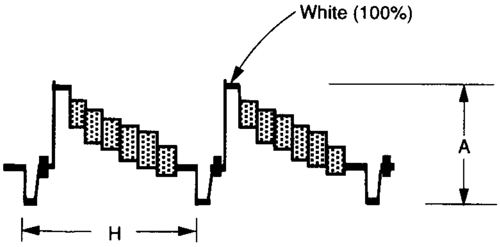


Fig. 6-3-2

Related Adjustments:

“Emphasis input level adjustment”, “PB Y level adjustment”, “Y FM carrier frequency adjustment”

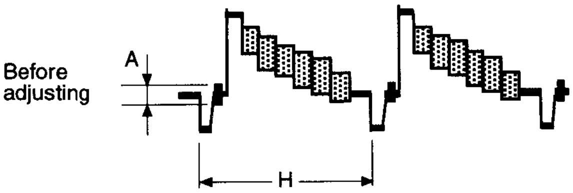
3-8. PB CHROMA LEVEL CHECK

Purpose:	The playback chroma level is kept to constant level.
Adjustment error:	Color of playback picture can be thinner or thicker than normal picture.

Mode	Playback
Signal	Alignment tape: color bar segment of operation check tape • Normal mode WR5-5CSP
Measurement Point	CN102 pin⑥
Measuring Instrument	Oscilloscope
Adjustment Page	
Adjustment Address	
Specification Value	A=150±15mVp-p (BURST LEVEL)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Playback the color bar segment of the normal mode alignment tape (WR5-5CSP).
2				Check that the burst signal level satisfies the specification.



3-9. PB Y OUT LEVEL ADJUSTMENT

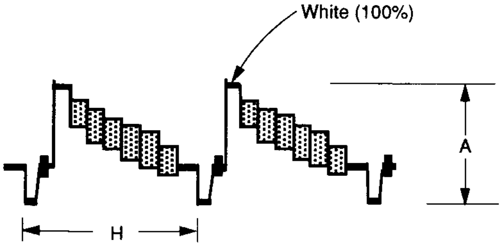
Purpose: Adjusts playback video level for the specification value.

Adjustment error: Playback picture can be too brighter or too darker than normal picture.

Mode	Playback
Signal	Alignment tape: color bar segment of operation check tape • Normal mode WR5-5CSP
Measurement Point	VIDEO output terminal (terminated in 75Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	1B
Specification Value	A=1.00±0.05Vp-p

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2				Playback the color bar segment of the normal alignment tape (WR5-5CSP playback)
3	F	1B		Change data using PLAY and STOP buttons so that the playback signal level (A) satisfies the specification.
4				Press the PAUSE button.
5	6	00	00	After setting the data, press the PAUSE button. (End)



3-10. FE OSC CHECK

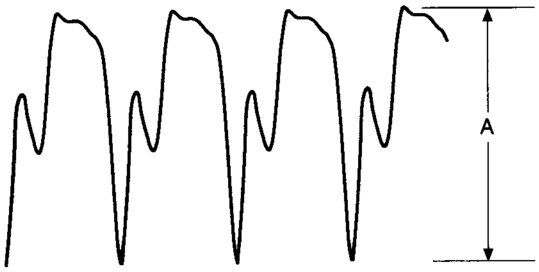
Purpose: Check the oscillating frequency and level of the flying erase (FE) signal.

Adjustment error: If REC-PAUSE recording is repeated, unerased area is left in the junctions between the editings which results in increase of noise or previous picture can be seen.

Mode	CAM-REC
Signal	Any signal
Measurement Point	CN101 pin ⑪
Measuring Instrument	Oscilloscope and frequency counter
Adjustment Page	
Adjustment Address	
Specification Value	A=7.0Vp-p or more (MP mode) f=7.2±0.5MHz (MP mode)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Insert a normal MP type tape.
2				Make a recording.
3				Check that the FE signal level satisfies the specification.
4				Check that the FE signal frequency satisfies the specification.



f=7.2±0.5MHz

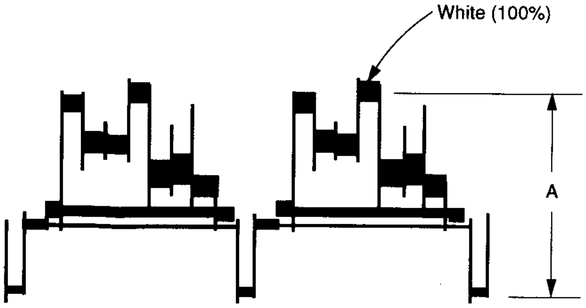
3-11. EMPHASIS INPUT LEVEL ADJUSTMENT

Purpose:	Adjusts the record emphasis characteristics to the specification value.
Adjustment error:	Luminance signal smear, blurred picture, too much emphasized edge of overall video characteristics.

Mode	CAM-REC
Signal	Color bar chart
Measurement Point	· CN102 PIN④ · VIDEO output terminal (terminated in 75Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	1A
Specification Value	A=(Vo×0.96×500) mVp-p± 2%

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	01	47	After setting the data, press the PAUSE button.
3				Measure amplitude of the VIDEO OUT. The measured value is "Vo"[V].
4	F	1A		Change data using PLAY and STOP buttons so that the Y signal level at CN102 pin④ (A) satisfies the specification.
5				Press the PAUSE button.
6	6	01	00	After setting the data, press the PAUSE button.
7	6	00	00	After setting the data, press the PAUSE button. (End)

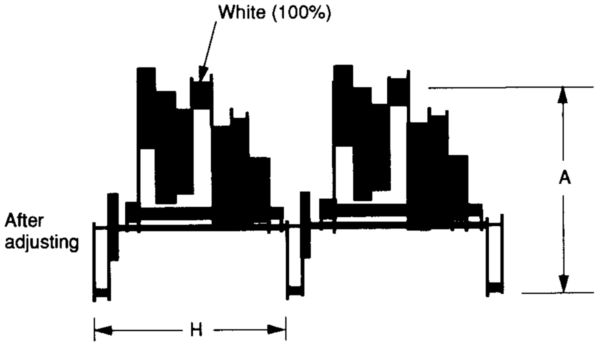


3-12. Y FM DEVIATION ADJUSTMENT

Purpose: Adjusts the FM signal to be recorded on tape to the 8 mm format. (Adjusts the frequency deviation of normal mode Y FM signal.)

Adjustment error: Too bright or too dark overall picture. Overmodulation picture. (If deviation is too wide,or too narrow.)

Mode	CAM-REC and playback
Signal	Color bar chart
Measurement Point	· CN102 pin② · VIDEO output terminal (terminated in 75Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	17
Specification Value	A=(Vo×0.96)Vp-p±2%



Related Adjustments:

"Normal mode Y FM deviation adjustment"

Note : The "Emphasis input level adjustment", "PB Y level adjustment", must have already been completed.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Insert a normal MP type tape.
2	6	00	01	After setting the data, press the PAUSE button. (Preparation)
3	6	01	47	After setting the data, press the PAUSE button.
4				Shoot and record the color bar chart. The video out level at that setup is "Vo".
5				Playback the recorded signal.
6				Compare the playback signal level (A) with the specification value. If the specification value is satisfied, the adjustment is complete.
7	F	17		If the specification value is satisfied, change data using PLAY and STOP buttons. • If the playback signal level is bigger than the specification value, decrease the data. • If the playback signal level is smaller than the specification value, increase the data.
8				Press the PAUSE button.
9				Return to step 4.
10	6	01	00	After setting the data, press the PAUSE button.
11	6	00	00	After setting the data, press the PAUSE button. (End)

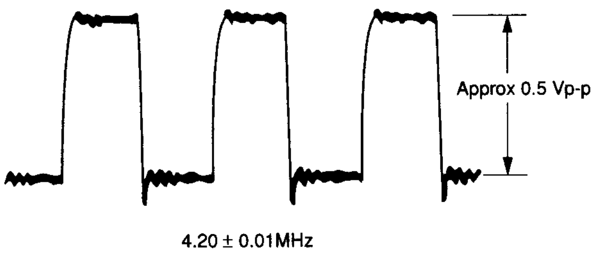
3-13. Y FM CARRIER FREQUENCY ADJUSTMENT

Purpose:	Adjusts the FM signal to be recorded on tape to the 8 mm format. (Adjusts the carrier frequency of normal mode Y FM signal.)
Adjustment error:	(If frequency is low) Overall picture will be blurred signal. (If frequency is high) Overall picture will have black streaking noise. S/N will be deteriorated.

Mode	CAM-REC
Signal	Any signal
Measurement Point	IC201 pin㊶
Measuring Instrument	Frequency counter,Oscilloscope
Adjustment Page	F
Adjustment Address	19
Specification Value	4.20±0.01MHz

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	01	43	After setting the data, press the PAUSE button.
3	F	19		Change data using PLAY and STOP buttons so that the Y signal level (A) satisfies the specification. (Record mode)
4				Press the PAUSE button.
5	6	01	00	After setting the data, press the PAUSE button.
6	6	00	00	After setting the data, press the PAUSE button. (End)



3-14. CHROMA EMPHASIS fo ADJUSTMENT

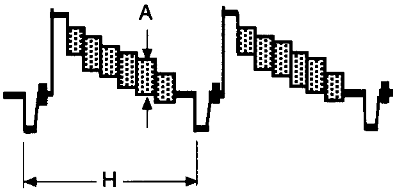
Purpose: Adjust fo of the chroma emphasis to the specified frequency range.

Adjustment error: The bust and chroma level becomes too big during playback.

Mode	Playback
Signal	Color bar signal (WR5-5CSP)
Measurement Point	IC201 pin ⑳
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	1E
Specification Value	Minimizes the chroma component (A in the following diagram)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	F	1E		Change data so that the chroma component (A) is minimized.
3				Press the PAUSE button.
4	6	00	00	After setting the data, press the PAUSE button. (End)



3-15. REC Y LEVEL ADJUSTMENT

Purpose: Maintains a constant level of Y FM, chroma AFM and ATF signals when recording on tape.

Adjustment error: (If level is low) Poor S/N of playback picture
(If level is high) Black streaking noise appears.

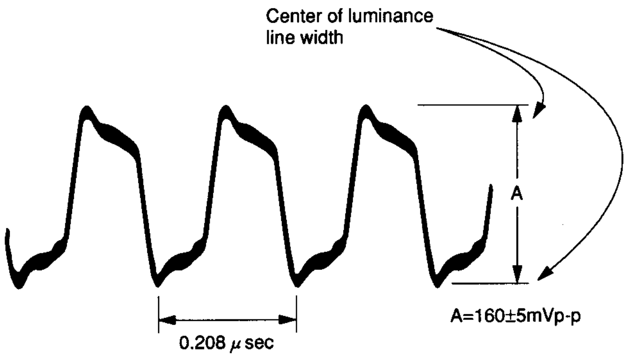
Connection: Connect CN102 pin⑧ (RF SWP) to GND.

Mode	CAM-REC (SP)
Signal	No signal
Measurement Point	CN102 pin② (check connector)
Measuring Instrument	Oscilloscope (Note)
Adjustment Page	F
Adjustment Address	1F
Specification Value	A=160±5mVp-p

Note: Use the MP type tape. If an oscilloscope has the bandwidth limiting switch, set to on position.

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2				Insert the MP tape to establish record mode.
3	6	01	43	After setting the data, press the PAUSE button.
4	F	1F		Change data using PLAY and STOP buttons so that the REC Y RF level (A) satisfies the specification.
5				Press the PAUSE button.
6	6	01	00	After setting the data, press the PAUSE button.
7	6	00	00	After setting the data, press the PAUSE button. (End)



3-16. REC L LEVEL ADJUSTMENT

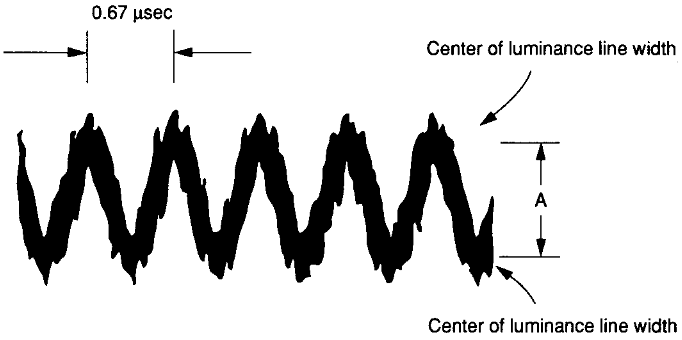
Purpose: Maintains a constant level of chroma, AFM and ATF signals when recording on tape.

Adjustment error: If level is low, audio distortion increases, ATF servo loses lock, and chroma S/N deteriorates.
If level is high, Y S/N deteriorates and white streaking noise appears.

Mode	CAM-REC (SP)
Signal	No signal
Measurement Point	CN102 pin② (check connector)
Measuring Instrument	Oscilloscope Frequency bandwidth limitation: 20 MHz OFF
Adjustment Page	F
Adjustment Address	21
Specification Value	A=8.494±0.3mV (AFM Level)

Adjustment procedure:

Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2	6	01	43	After setting the data, press the PAUSE button.
3	F	21		Change data using PLAY and STOP buttons so that the AFM signal level (A) satisfies the specification.
4				Press the PAUSE button.
5	6	01	00	After setting the data, press the PAUSE button.
6	6	00	00	After setting the data, press the PAUSE button. (End)


0.67 µsec
Center of luminance line width
A
Center of luminance line width

3-17. REC C LEVEL ADJUSTMENT

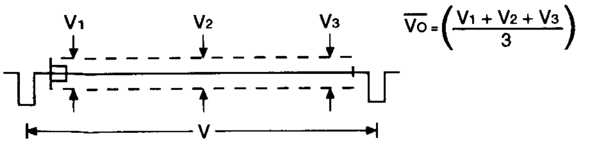
Purpose: Maintains a constant chroma level when recording on tape.

Adjustment error: If level is low, overall S/N deteriorates.
If level is high, S/N of Y signal at deep color deteriorates and white streaking noise appears.

Mode	CAM-REC
Signal	White pattern (See page 6-2)
Measurement Point	· CN102 pin② (Check connector) · VIDEO output terminal (terminated in 75Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	20
Specification Value	$A=\left(28.5\times\frac{\overline{Vo}}{700}\right)$mVp-p±2mVp-p

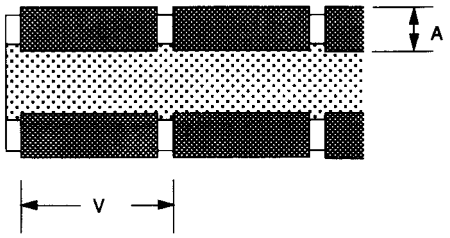
Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Shoot the all white pattern to the full picture frame.
2	6	00	01	After setting the data, press the PAUSE button. (Preparation)
3	6	01	45	After setting the data, press the PAUSE button.
4				Measure the chroma output level of the VIDEO OUT connector. Obtain the average value of three points (beginning, middle, end) of a vertical period. Call the average value $\overline{Vo}$ (mV).
5	F	20		Change data using PLAY and STOP buttons so that the REC signal at CN102 pin② amplitude (A) satisfies the specification.
6				Press the PAUSE button.
7	6	01	00	After setting the data, press the PAUSE button.
8	6	00	00	After setting the data, press the PAUSE button. (End)



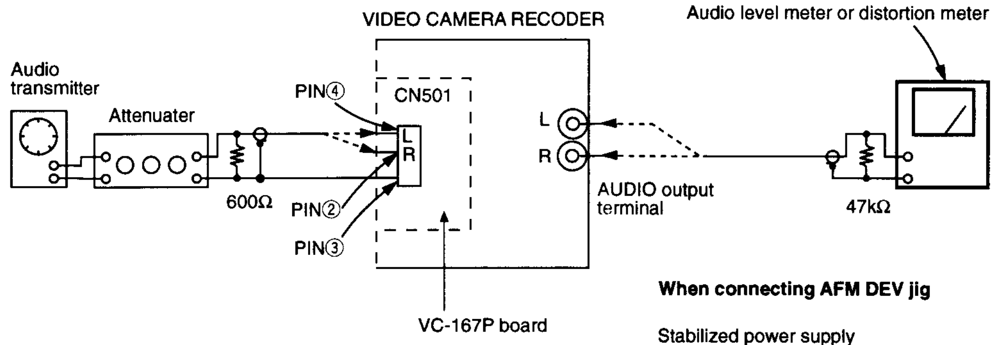
$$\overline{Vo}=\left(\frac{V_1+V_2+V_3}{3}\right)$$

VIDEO OUT Signal

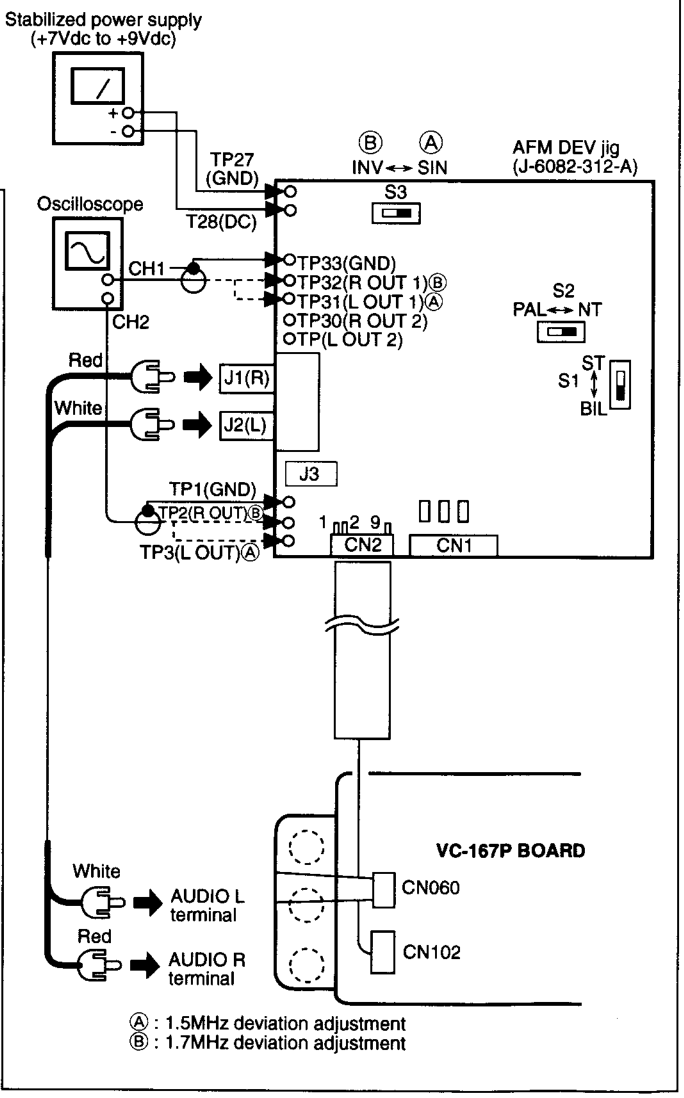


6-4. AUDIO SYSTEM ADJUSTMENT

- Use the alignment tape (WR5-5CSP) for audio system adjustment.
- Connect an audio input signal from VC-167P board CN501 as shown in Fig.6-4-1.


VIDEO CAMERA RECODER
Audio level meter or distortion meter
Audio transmitter
Attenuater
PIN④
CN501
L
R
600Ω
PIN②
PIN③
L
R
AUDIO output terminal
47kΩ
VC-167P board

When connecting AFM DEV jig


Stabilized power supply (+7Vdc to +9Vdc)
+
-
TP27 (GND)
T28(DC)
Ⓑ Ⓐ
INV↔SIN
S3
AFM DEV jig (J-6082-312-A)
Oscilloscope
CH1
CH2
TP33(GND)
TP32(R OUT 1)Ⓑ
TP31(L OUT 1)Ⓐ
TP30(R OUT 2)
TP(L OUT 2)
S2
PAL↔NT
ST
S1
BIL
Red
J1(R)
White
J2(L)
J3
TP1(GND)
TP2(R OUT)Ⓑ
TP3(L OUT)Ⓐ
1 2 9
CN2
CN1
VC-167P BOARD
CN060
CN102
White
AUDIO L terminal
Red
AUDIO R terminal

Ⓐ : 1.5MHz deviation adjustment
Ⓑ : 1.7MHz deviation adjustment

Fig.6-4-1

4-1. EE-OUTPUT LEVEL CHECK

Mode	Record
signal	CN501 PIN ④ INPUT (Left) CN501 PIN ② INPUT (Right) 400 Hz, −38 dBs
	Audio input from CN501 pin④ ②
Measurement Point	AUDIO output terminal (Left/Right) (no load)
Measuring Instrument	Audio level meter
Specification Value	−7.5 ±2.0 dBs

Check procedure

Order	Procedure
1	Check that 400 Hz signal level satisfies the specification.

4-2. 1.5MHz DEVIATION ADJUSTMENT

Purpose: Determines spectrum of the modulated L-ch (L+R/2 signal) signal during recording.

Adjustment error: Audio signal crosstalk deteriorates and audio level decreases in both record and playback modes.

Mode	Record
Signal	AFM DEV adjustment tool output signal to left and right channels of audio input connector
Measurement Point	CH1: TP31 of the AFM DEV adjustment tool CH2: TP3 of the AFM DEV adjustment tool
Measuring Instrument	Oscilloscope ADD mode CH2 INV mode
Adjustment Page	D
Adjustment Address	8F
Specification Value	Difference (A) between CH1 and CH2 signals is 40 mV or less.

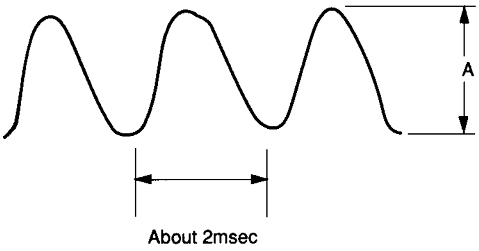
Connection

1) Connect CH2 of the AFM DEV adjustment tool and CN102 of VC-167P board.
2) Connect the audio output terminals (J1, J2) of the AFM DEV adjustment tool and Video/Audio input/output connector of the machine to be adjusted.
3) Connect DC power supply (+7 to +9V dc) to TP28 (DC), and TP27 (GND) of the AFM DEV adjustment tool.
4) Set the switches of the AFM DEV adjustment tool to the following positions.

S1 ....BIL position
S2 ....PAL position
S3 ....SIN position

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Select the same vertical sensitivity of CH1 and CH2 of oscilloscope.
2				Set the oscilloscope to ADD mode and set CH2 to INV mode.
3	1	00	01	After setting the data, press the PAUSE button. (Preparation)
4	D	8F		Change data using PLAY and STOP buttons so that the audio level difference (A) is minimized.
5				Press the PAUSE button.
6	1	00	00	After setting the data, press the PAUSE button. (End)



4-3. 1.7MHz DEVIATION ADJUSTMENT

Purpose: Determines spectrum of the modulated R-ch (L-R/2 signal) signal during recording.

Adjustment error: Audio signal crosstalk deteriorates and audio level decreases in both record and playback modes.

Mode	Record
Signal	AFM DEV adjustment tool output signal to left and right channels of audio input connector
Measurement Point	CH1: TP32 of the AFM DEV adjustment tool CH2: TP2 of the AFM DEV adjustment tool
Measuring Instrument	Oscilloscope ADD mode CH2 INV mode
Adjustment Page	D
Adjustment Address	8E
Specification Value	Difference (A) between CH1 and CH2 signals is 40 mV or less.

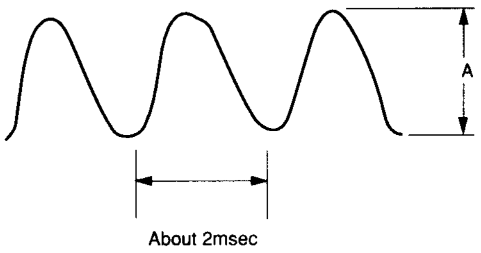
Connection

1) Connect CH2 of the AFM DEV adjustment tool and CN102 of VC-167P board.
2) Connect the audio output terminals (J1, J2) of the AFM DEV adjustment tool and Video/Audio input/output connector of the machine to be adjusted.
3) Connect DC power supply (+7 to +9V dc) to TP28 (DC), and TP27 (GND) of the AFM DEV adjustment tool.
4) Set the switches of the AFM DEV adjustment tool to the following positions.

S1 ....BIL position
S2 ....PAL position
S3 ....INV position

Adjustment procedure:

Order	Page	Address	Data	Procedure
1				Select the same vertical sensitivity of CH1 and CH2 of oscilloscope.
2				Set the oscilloscope to ADD mode and set CH2 to INV mode.
3	1	00	01	After setting the data, press the PAUSE button. (Preparation)
4	D	8E		Change data using PLAY and STOP buttons so that the audio level difference (A) is minimized.
5				Press the PAUSE button.
6	1	00	00	After setting the data, press the PAUSE button. (End)



4-4. BPF fo ADJUSTMENT

Purpose: Optimizes fo of BPF inside IC.

Adjustment error: Incorrect discrimination of monaural/stereo and increase of noise at high output of audio volume are resulted.

Mode	Playback
Signal	Alignment tape:(WR5-9CS)
Measurement Point	AUDIO output terminal (Left/Right)
Measuring Instrument	Audio level meter
Adjustment Page	F
Adjustment Address	15
Specification Value	Distortion : 1% or less.

Adjustment procedure:

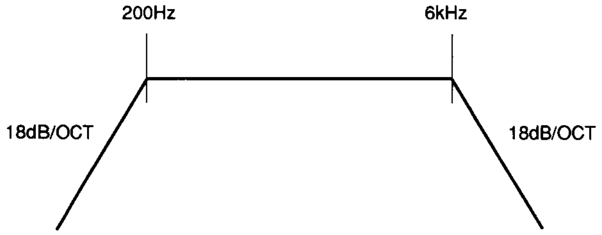
Order	Page	Address	Data	Procedure
1	6	00	01	After setting the data, press the PAUSE button. (Preparation)
2				Playback the Stereo segment of the WR5-9CS alignment tape.
3	F	15		Press the PLAY and STOP buttons until the output levels of left and right channel are the same level.
4				Press the PAUSE button.
5	6	00	00	After setting the data, press the PAUSE button. (End)

4-5. OVERALL SIGNAL LEVEL, DISTORTION AND SEPARATION CHECK

Purpose:

Mode	CAM-REC and playback
Signal	① CN501 pin ④ :400Hz, -38dBs CN501 pin ② : No signal ② CN501 pin ④ :No signal CN501 pin ② :400Hz, -38dBs
Measurement Point	AUDIO output terminal (Left) AUDIO output terminal (Right)
Measurement Instrument	Audio level meter and distortion meter
Specification Value (Note)	Signal level ① Left output : -7.5± 2dBs Right output : -27.5dBs or less ② Left output : -27.5dBs or less Right output : -7.5± 2dBs Distortion Left/Right output : 0.8% or less

Note: The value when band-pass filter of 200Hz to 6kHz is used.



Check procedure:

Order	Procedure
1	Input 400Hz, -38dBs signal to CN501 pin ④. Short pin ② and ③ of CN501.
2	Check that the right and left channels of AUDIO output terminal satisfy the specification ①. Check that distortion satisfies the specification.
3	Input 400Hz, -38dBs signal to CN501 pin ②. Short pin ③ and ④ of CN501.
4	Check that the right and left channels of AUDIO output terminal satisfy the specification ②. Check that distortion satisfies the specification.

4-6. OVERALL NOISE LEVEL CHECK

Purpose: Checks noise level.

Mode	CAM-REC and playback
Signal	No signal: VC-167P board CN501 (Note)
Measurement Point	AUDIO output terminal (Left/Right)
Measuring Instrument	Audio level meter (using IHF-A curve weighting filter)
Specification Value	−65 dBs or less

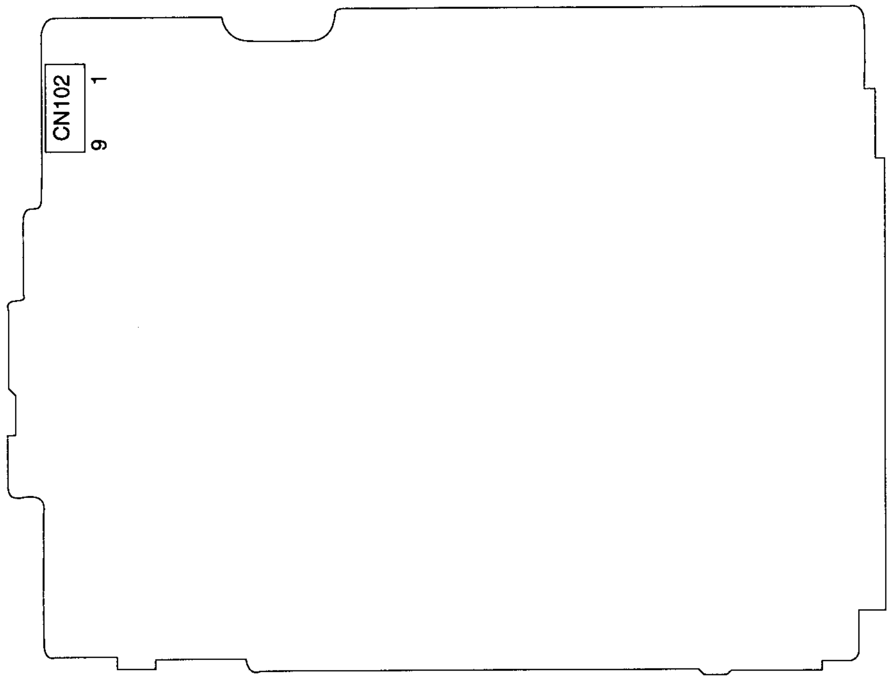
Note: Before making short circuit between CN501 pin③ and pin④, pin③ and pin②, remove the flexible board from CN501

Check procedure:

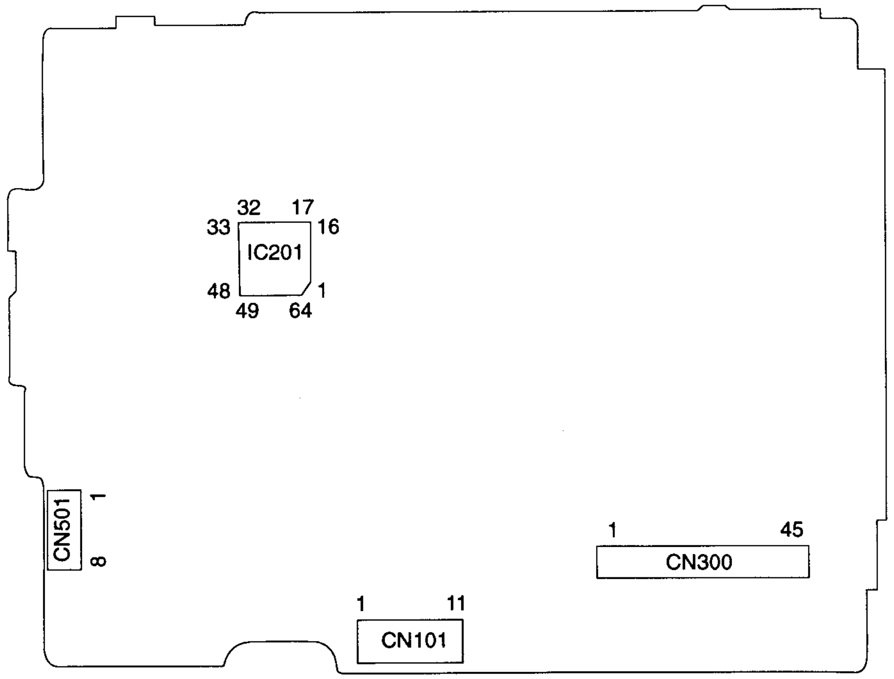
Order	Procedure
1	Insert a shorting to pin③ and pin④, pin③ and pin② as CN501.
2	Make recording.
3	Remove the shorting plug.
4	Playback the recorded segment.
5	Confirm that the noise level at audio output terminal (Left/Right) is −65 dBs or less.

ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

VC-167P BOARD (SIDE A)



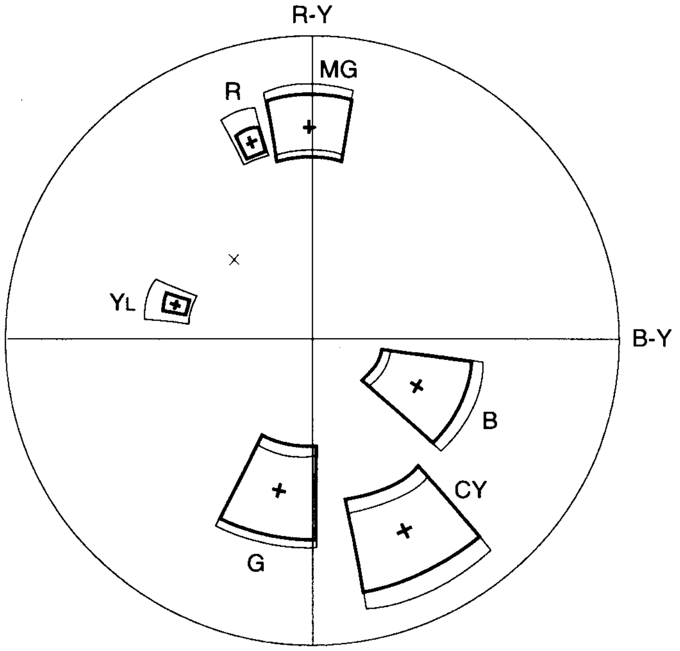
VC-167P BOARD (SIDE B)



FOR CAMERA COLOR REPRODUCTION ADJUSTMENT (CCD-TR490E MODEL)

Take a copy of CAMERA COLOR REPRODUCTION FRAME and Parts reference sheets with a clear sheet for use.

⊞ : WEIGHT OFF MODE
☐ : WEIGHT ON MODE

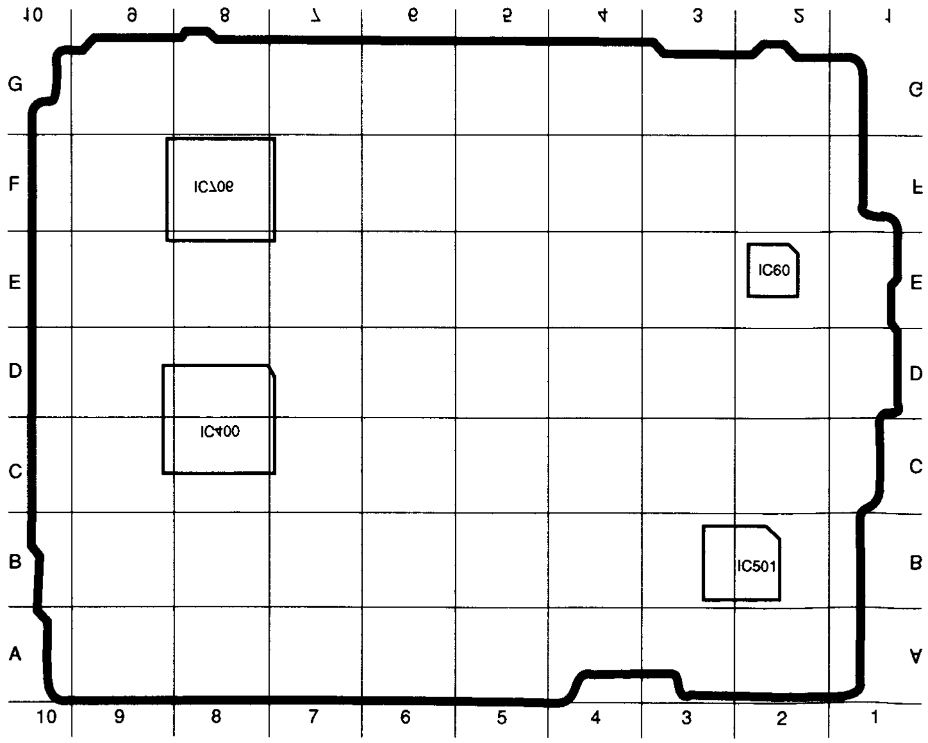

R-Y
MG
R
YL
B-Y
B
CY
G

CCD-TR490E

〈PARTS REFERENCE SHEET〉

You can find the parts position of mount locations applying to VC-167P board of a set.

VC-167P CCD-TR490E **SIDE A**


10
9
8
7
6
5
4
3
2
1
G
F
E
D
C
B
A
IC706
IC60
IC400
IC501

SIDE B CCD-TR490E VC-167P